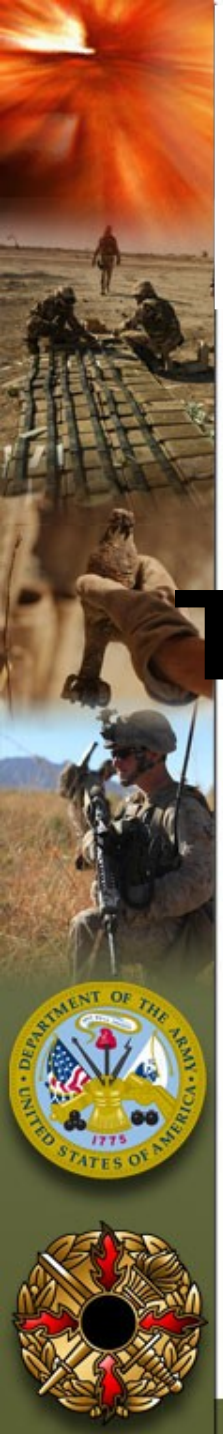


Tactical Explosives Safety

Ammo-106

Purpose

The purpose of this workshop is to provide a general overview of tactical explosives safety concepts.

Material is drawn primarily from explosives safety standards set forth in the following publications:

DoDM 6055.09-M
DoD Ammunition and Explosives Safety Standards

DA PAM 385-64
Ammunition and Explosives Safety Standards

Workshop Focus – Topic 1

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP)

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

FOB Falcon AHA, Iraq, 2006

Causes:

- Incoming round (indirect fire)
- Excess ammo present – Ammo stored for weapon systems not present (155 mm)

Assets lost:

- Contractors had billets close to the ammunition transfer and holding point (ATHP) – CHUs flattened by blast overpressure

Key issue:

- T-Wall falsely believed to give protection to inhabited areas and on base roads

FOB Falcon, cont.

FOB Falcon, cont.

FOB Falcon, cont.

FOB Falcon, cont.

Kirkuk Munitions Storage Area, Iraq, June 2004

Cause:

- Mortar hit near the MSA, which created a grass fire

Assets lost:

- Fire went through the area exploding outdoor storage sites containing 200,000 lb NEW of bombs

Kirkuk, cont.

Kirkuk, cont.

Topic 1 General Explosives Safety

This section will discuss the following:

1.1 Primary hazards

1.2 Protection

1.3 Finding the net explosive weight (NEW)

1.1 Primary Hazards

There are two primary hazards:

1. Blast

- Overpressure
- Shock wave

Explosion Video
11,000 lb

Blast Video
100,000 lb

1.1 Primary Hazards, cont.

2. Fragments

- Two types:
  - Primary: Weapon casings and components
  - Secondary: Debris
- Two threats:
  - Low angle; high velocity
  - High angle and lobbed; low velocity

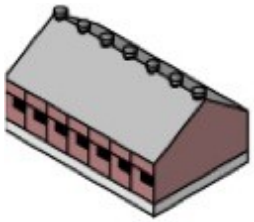
Blast and Fragment 8,100 lb

Blast and Fragment 2,000 lb

1.2 Two Types of Blast Protection

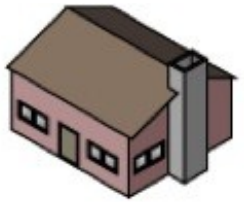
Two means of blast protection:

1. Distance



PES

Separation distance between a **potential explosion site (PES)** and an **exposed site (ES)**



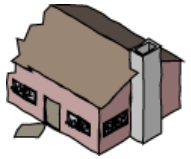
ES

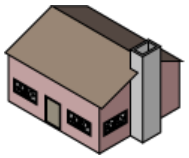
2. Protective construction

Very substantial construction that is usually very expensive and difficult to achieve, such as an **earth covered magazine (ECM)**

ECM

1.2 Effects of Blast Overpressure

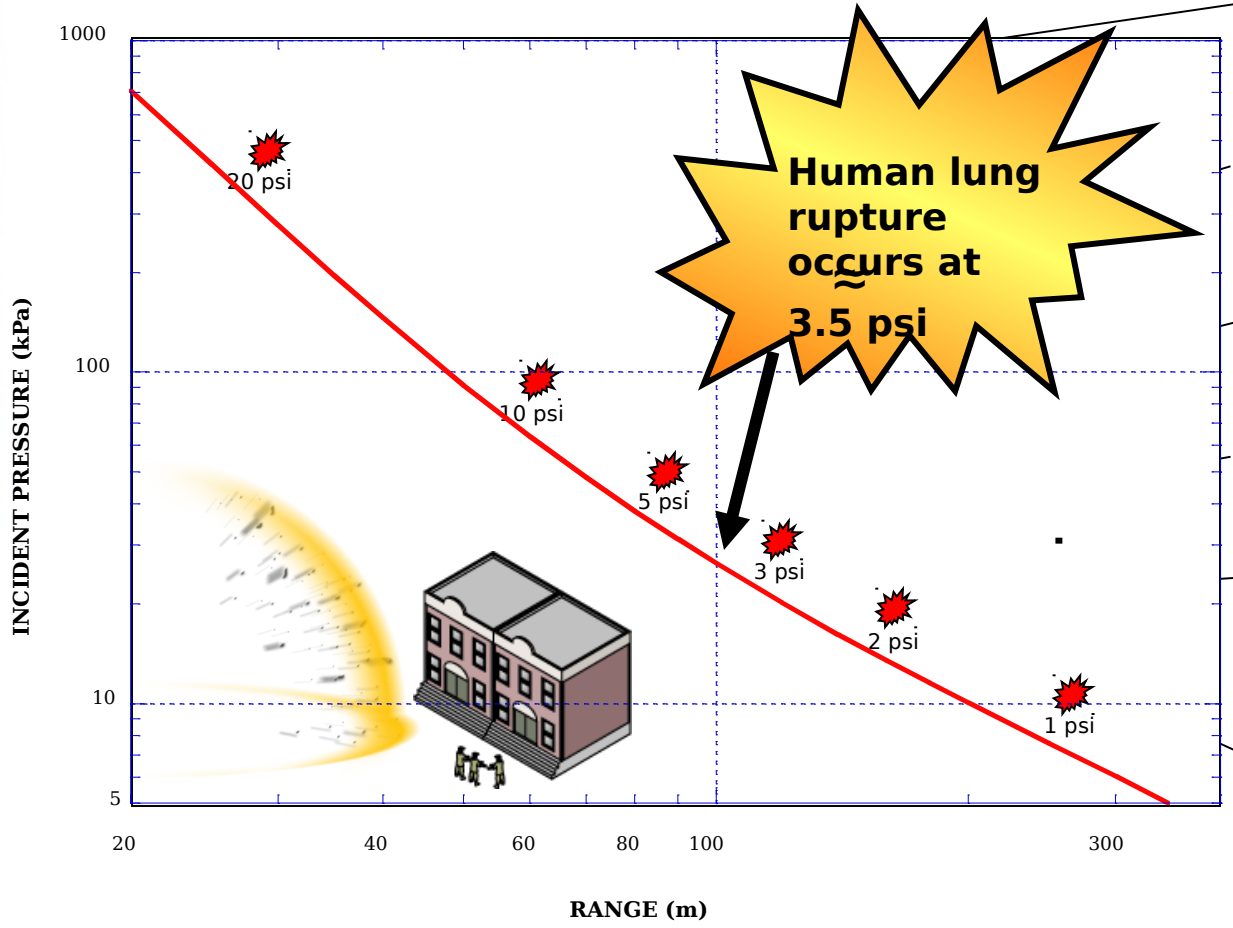




30 Meters	60 Meters	80 Meters	120 Meters	160 Meters	260 Meters
Heavily built concrete buildings are severely damaged or demolished. Fatalities approach 100%.	Reinforced concrete buildings are severely damaged or demolished. Most people are killed.	Most buildings collapse. Injuries are universal. Fatalities are widespread.	Residential structures collapse. Serious injuries are common. Fatalities may occur.	Moderate damage to houses (windows and doors blown out and severe damage to roofs) . Injuries from flying glass and debris.	Window glass shatters. Light injuries from fragments occur.

1.2 Effects of Blast Overpressure, con

Effects of blast overpressure on various structures and the human body.

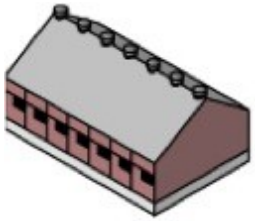


- Heavily built concrete buildings are severely damaged or demolished. Fatalities approach 100%.
- Reinforced concrete buildings are severely damaged or demolished. Most people are killed.
- Most buildings collapse. Injuries are universal, fatalities are widespread.
- Residential structures collapse. Serious injuries are common, fatalities may occur.
- Moderate damage to houses (windows and doors blown out and severe damage to roofs). People injured by flying glass and debris.
- Window glass shatters. Light injuries from fragments occur.

1.2 Two Types of Fragment Protection

Two means to protect from fragments:

1. Distance



PES

The separation distance between a **PES** and an **ES**

ES

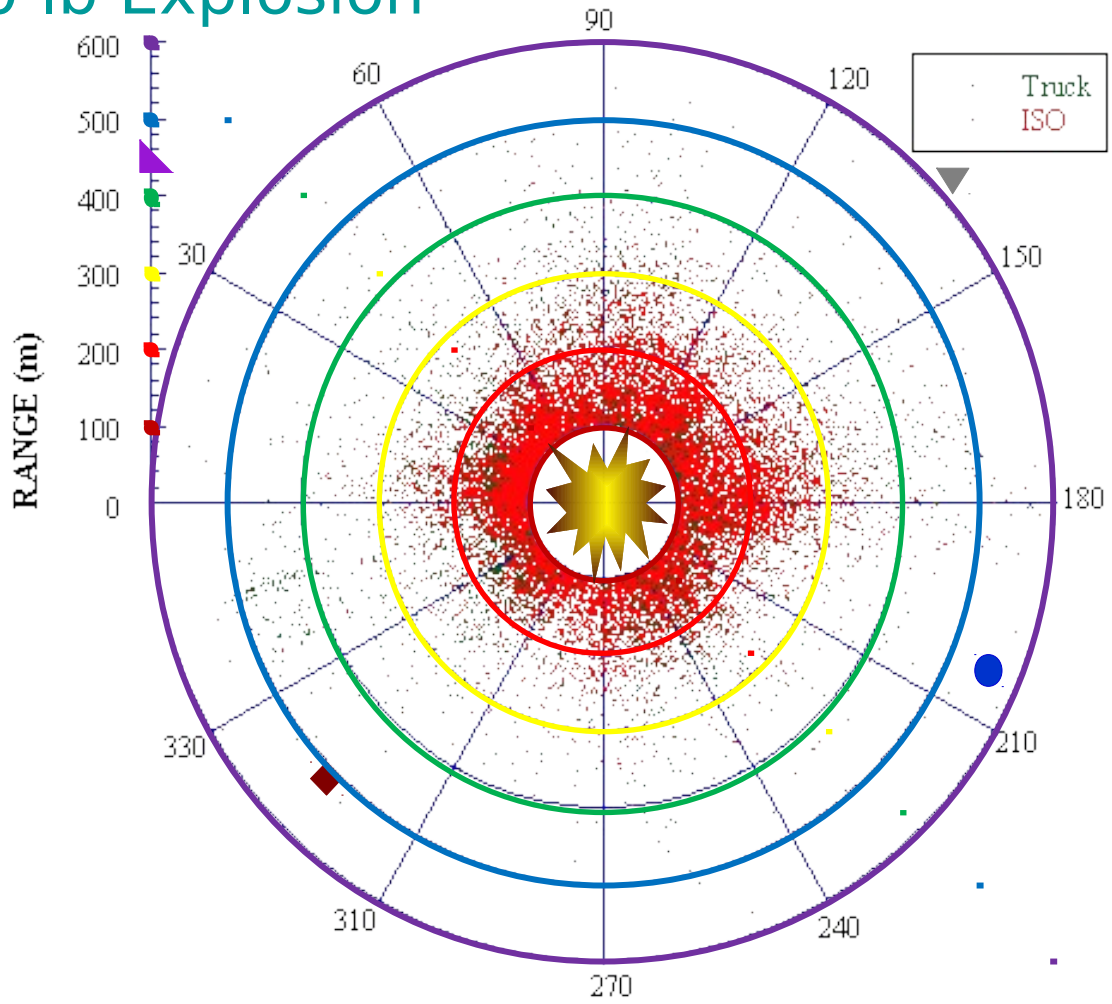
2. Protective construction

Construction that is not as substantial, expensive or difficult than what is required for blast protection

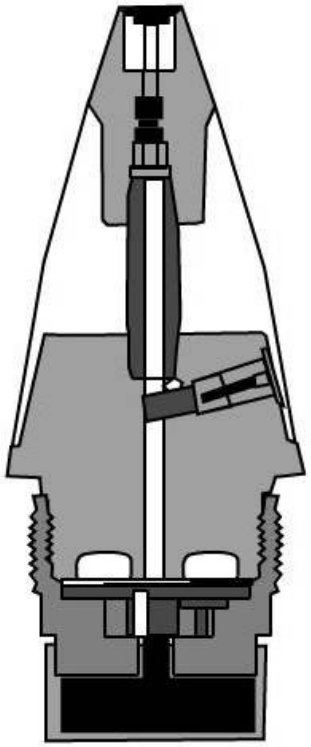
Overhead protection

1.2 Fragmentation Chart

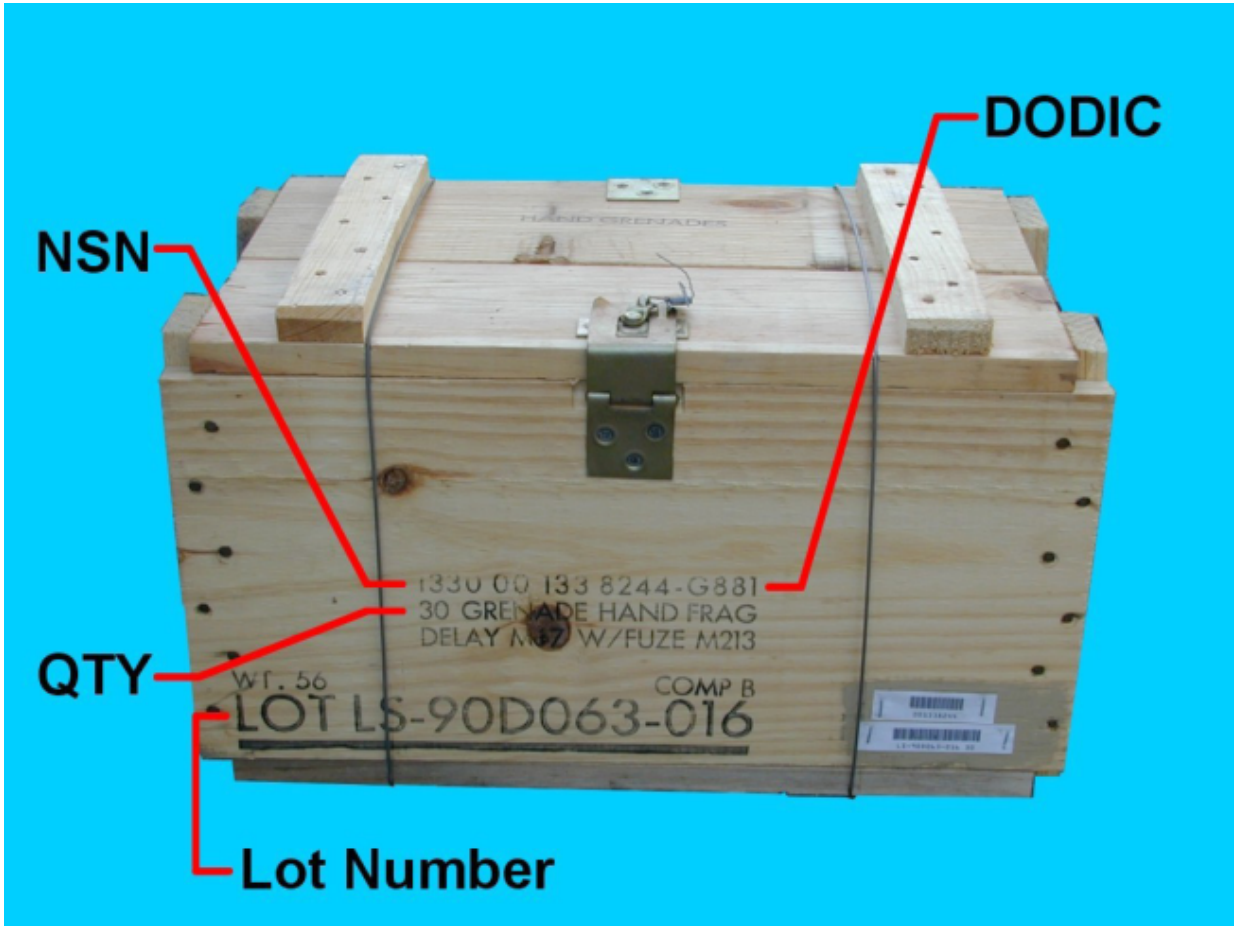
Fragmentation spread from an 8,100 lb Explosion



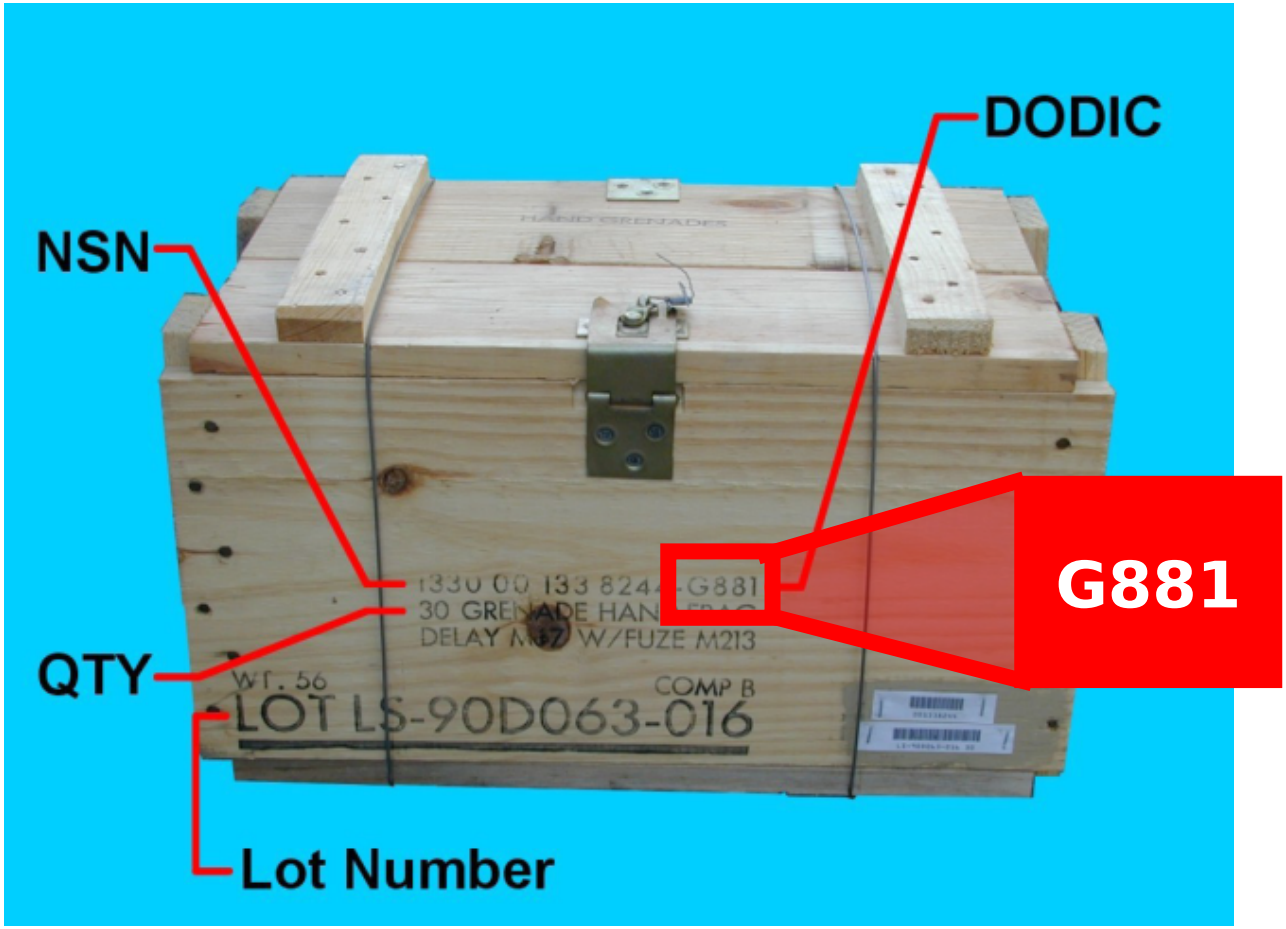
1.3 Finding the Net Explosive Weight (NE



1.3 Where do you find the NEW?

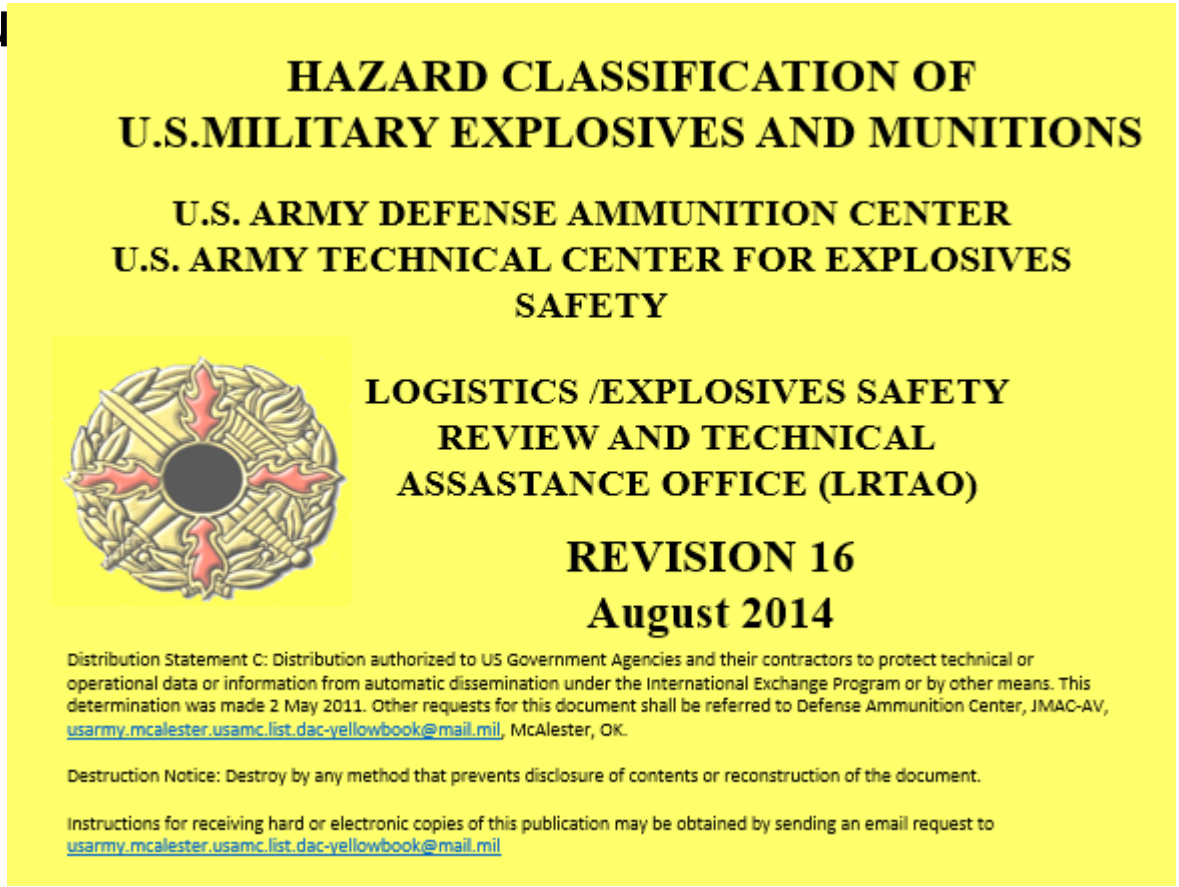


1.3 DODIC


DODIC
NSN
G881
QTY
Lot Number
1330 00 133 8244
30 GRENADE HAN
DELAY M
W/FUZE M213
WT. 56
COMP B
LOT LS-90D063-016

1.3 The Yellow Book

The Yellow Book is the **UNOFFICIAL** explosives and munitions information sou



HAZARD CLASSIFICATION OF U.S.MILITARY EXPLOSIVES AND MUNITIONS

U.S. ARMY DEFENSE AMMUNITION CENTER
U.S. ARMY TECHNICAL CENTER FOR EXPLOSIVES SAFETY

LOGISTICS /EXPLOSIVES SAFETY REVIEW AND TECHNICAL ASSASTANCE OFFICE (LRTAO)

REVISION 16
August 2014

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1.3 Yellow Book Table of Contents

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1.3 Sources

Two different sources:

1. Joint Hazard Classification System (JHCS)
    - The **official** source for determining NEW, as well as Hazard Class Division (HCD)

- https://mhp.redstone.army.mil

1. Yellow Book
    - An **unofficial** source for determining NEW and HCD

- Available by email request to: usarmy.mcalester.usamc.list.dac-yellowbook@mail.mil

1.3 Yellow Book HC Listings by DODIC

DODIC	NOMENCLATURE (1305)	HC/DIV CG	NOTE (s)	UNO SER#	CII	NEW QDLB	NEW QDKG
AA01	CTG, 5.56MM AP M995 LNKD	1.4S		0012	4	0.0040	0.0018
AA02	CTG, 5.56MM 4 AP M995/1 TR M856	1.4S		0012	4	0.0047	0.0021
AA03	CTG, 7.62MM AP M993 SNGL RD	1.4C		0339	4	0.0064	0.0029
AA04	CTG, 7.62MM 4 AP M993/1 TR M62	1.4C		0339	4	0.0079	
AA05	CTG, CAL .50 1 AP M2/1 API-T M20	1.2.2G	4	0009	4	0.0013	0.0006
AA06	CTG, CAL .50 1 /1 AP/1 API-T	1.2.2G	4	0009	4	0.0015	0.0007
AA07	CTG, CAL .50 1 AP M2/1 API-DT M20	1.2.2G	4	0009	4	0.0013	0.0006

AA01
AA02
AA03
AA04
AA05
AA06
AA07

DODIC

A four-digit code assigned by the Defense Logistics Services Center (DLSC)

Excerpted from the Yellow Book, Hazard Classification Listing (HCL) by DODIC section, page 1.

1.3 Yellow Book HC Listings

DODIC QDKG	NOMENCLATURE (1305)	HC/DIV CG	NOTE [illegible]	UNO SER#	CIIC	NEW QDLB	NEW
AA01 0.0018	CTG, 5.56MM AP M995 LNKD	1.4S		0012	4	0.0040	
AA02 0.0021	CTG, 5.56MM 4 AP M995/1 TR M856	1.4S		0012	4	0.0047	
AA03 0.0029	CTG, 7.62MM AP M993 SNGL RD	1.4C		0339	4	0.0064	
AA04 0.0036	CTG, 7.62MM 4 AP M993/1 TR M62	1.4C		0339	4	0.0079	
AA05 0.0006	CTG, CAL .50 1 API MK211-0/1 AP M2/1 API-T M20	1.2.2G	4	0009	4	0.0013	
AA06 0.0007	CTG, CAL .50 1 API/1 AP/1 API/1 AP/1 API-T	1.2.2G	4	0009			
AA07 0.0006	CTG, CAL .50 1 API MK211-0/1 TP M2/1 API-T M20	1.2.2G	4	0009			

1.4S
1.4S
1.4C
1.4C
12.2G
12.2G
12.2G

UN Hazard Classification & Division

The UN system consists of nine classes of dangerous materials, with explosives designated as Class 1.

Excerpted from the Yellow Book, Hazard Classification Listing (HCL) by DODIC section, page 1.

1.3 Yellow Book NEW Listings

DODIC QDKG	NOMENCLATURE (1305)	HC/DIV CG	NOTE (s)	UNO SER#	CL	NEW QDLB	NEW
AA01 0.0018	CTG, 5.56MM AP M995 LNKD	1.4S		0012		0.0040	
AA02 0.0021	CTG, 5.56MM 4 AP M995/1 TR M856	1.4S		0012		0.0047	
AA03 0.0029	CTG, 7.62MM AP M993 SNGL RD	1.4C		0339	4	0.0064	
AA04 0.0036	CTG, 7.62MM 4 AP M993/1 TR M62	1.4C		0339	4	0.0079	
AA05 0.0006	CTG, CAL .50 1 API MK211-0/1 AP M2/1 API-T M20	1.2.2C			4	0.0013	
AA06 0.0007	CTG, CAL .50 1 API/1 AP/1 API/1 AP/1 API-T	1.2.2C			4	0.0015	
AA07 0.0006	CTG, CAL .50 1 API MK211-0/1 AP M2/1 API-DT M20	1.2.2C			4	0.0013	

0.0040
0.0047
0.0064
0.0079
0.0013
0.0015
0.0013

Net Explosive Weight (NEW)

The actual weight in pounds of explosive mixtures or compounds (including the TNT equivalent of energetic material).

The NEW is used in determining explosive limits and explosive quantity data arcs.

Excerpted from the Yellow Book, Hazard Classification Listing (HCL) by DODIC section, page 1.

1.3 Hazard Class and Division

APPENDIX A

HAZARD CLASS and DIVISION (HD) IDENTIFICATION
from 49 CFR, 1 October 2008, section 173.2

Class No.	Division No. (if any)	Name of Class or Division	49 CFR reference for definitions
Class None		Forbidden materials	173.21
Class None		Forbidden explosives	173.54
Class 1 -	1.1	Explosives (with a mass explosion hazard)	173.50
	1.2	Explosives (with a projection hazard)	173.50
	1.3	Explosives (with predominately a fire hazard)	173.50
	1.4	Explosives (with no significant blast hazard)	173.50
	1.5	Very insensitive explosives, blasting agents	173.50
	1.6	Extremely insensitive detonating substances	173.50
Class 2 -	2.1	Flammable gas	173.115
	2.2	Non-flammable compressed gas	173.115
	2.3	Poisonous gas	173.115
Class 3 -		Flammable and combustible liquid	173.120
Class 4 -	4.1	Flammable solid	173.124
	4.2	Spontaneously combustible material	173.124
	4.3	Dangerous when wet material	173.124
Class 5 -	5.1	Oxidizer	173.127
	5.2	Organic peroxide	173.128
Class 6 -	6.1	Poisonous materials	173.132
	6.2	Infectious substance (Etiologic agent)	173.134
Class 7 -		Radioactive material	173.403
Class 8 -		Corrosive material	173.136
Class 9 -		Miscellaneous hazardous material	173.140
Class None -		Other regulated material: ORM-D	173.144

A1

1.3 HC Divisions

Division 1.4

Explosives that present a minor explosion hazard (e.g., small arms)

With this type of explosion, you can expect the “popcorn” effect; however there are no:

- Major blast hazards
- Major fragmentation hazards

7.62 mm ammo

1.3 Determining NEW

Based on the DODIC G881:

1. Identify the amount of ammo: 2 boxes @ 30 rounds per box

2 X 30 = 60 rounds

2. Locate the NEW in the JHCS or Yellow Book:

DODIC	Nomenclature (1310)	HC/DIV CG	Note (s)	UNO SER#	CIIC	NEW QDLB	NEW QDKG
G878	FUZE, HAND GREN M228 (1330)	1.4B		0257	4	0.0045	0.0020
G880	GRENADE. HAND FRAG M61	(04)1.1F		0292	2	0.3787	0.1718
G881	**GRENADE, HAND FRAG M67**		**(04)1.1F**			**0292**	**2**
0.4137	**0.1876**						
00-301-1970, * (N/A); ALL OTHERS, * (04)							
G892	GRENADE, HAND FRAG MK2A1	1.1F		0292	2	0.1000	0.0454

Excerpted from the Yellow Book, page 58

3. Multiply: 60 X 0.4137 lb = 24.83 lb

1.3 Determining the NEW, cont.

A group of soldiers on tour can be expected to carry the following NEW:

B546 CTG, 40 MM HEDP M433	(0.1008 lb)144	=	14.52 lb
C995 CTG & Launcher, 84 MM M136 AT-4	(1.8404 lb)15	=	27.61 lb
G881 Grenade, Hand Frag M67	(0.4137 lb)60	=	24.82 lb
Total NEW			**66.96 lb**

1.3 Storage Compatibility

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S
X
X
X
X
X
X
X
X
X
X

1.3 Appendix E

APPENDIX E
STORAGE COMPATIBILITY GROUP (SCG) MIXING CHART for STORAGE
from DA Pam 385-64, 28 November 1997, w/Change 1, 15 December 1999 - Chapter 4 and DoD 6055.09-STD, 29 February 2008, w/Change 1, 24 Mar 2009 - Chapter 3
Table below is identical to Table 4-3 in DA Pam 385-64 and Table C3.T1 in DoD 6055.09-STD.

GROUP	A	B	C	D	E	F	G	H	J	K	L	N	S
A	X	Z											
B	Z	X	Z	Z	Z	Z	Z					X	X
C		Z	X	X	X	Z	Z					X	X
D		Z	X	X	X	Z	Z					X	X
E		Z	X	X	X	Z	Z					X	X
F		Z	Z	Z	Z	X	Z					Z	X
G		Z	Z	Z	Z	Z	X					Z	X
H								X					X
J									X				X
K										Z			
L											*		
N		X	X	X	X	Z	Z					X	X
S		X	X	X	X	X	X	X	X			X	X

Excerpted from the Yellow Book, page 17

TABLE NOTES - from DA Pam 385-64
A Draft-Revision to DA Pam 385-64 contains changes to the below notes and appears in Chapter 7.
1. "X" indicates that these groups may be combined in storage, otherwise, mixing is either prohibited or restricted according to note #2.
2. "Z" indicates that, when warranted by operational considerations or magazine nonavailability and when safety is not sacrificed, logical mixed storage of limited quantities of some items of different groups may be approved. These relaxations involving mixed storage shall be approved by the MACOM and are not considered waivers. However, DA shall determine which items within Group K may be stored together and which must be stored separately. Group K requires not only separate storage from other groups but may also require separate storage within the group.

1.3 Max NEW, SCG and HD Mixing

		Locations				
		Peacetime	**Wartime BLAHA**	**Wartime Airfield**	**Hesco Barricade***	**Steel Bin Barricade**
Factors	**AMMO Storage Location**	ASP, CSA, TSA, Depot	BLAHA	Combat Air Operations	AHA	ASP
	MAX New	500,000	8,818	500,000	8,818	30,000
	Compatibility	Comply	Ignore Don't mix H,J, K or L	Comply	Comply	No SG 5
	HD Mixing	Sum of 1.1, 1.2, 1.3 = Total NEW				

1.3 Appendix S

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Workshop Focus – Topic 2

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

FOB Marez, Iraq, May 2003

Twelve-warehouse complex

- Eleven contained captured enemy ammunition (CEA)
  - One warehouse was used as troop billets

QASAS advised Command to vacate troops

- Troops vacated the warehouse billets
- CEA exploded one week later

FOB Marez, cont.

Captured enemy ammunition

Troop billeting

FOB Marez, cont.

Topic 2 Explosives Safety Quantity Distance

This section will discuss the following:

2.1 Quantity Distance

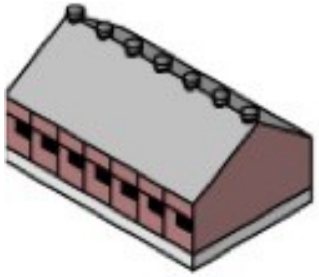
2.2 Types of Exposures

2.3 Safe Separation Distance

2.4 Barricades

2.5 Bulk Fuel Storage Area

2.1 What is Quantity Distance?



Quantity of explosive material

Quantity distance (QD) is the quantity of explosive material and distance separation you provide a target.

Distance separation

Exposed site

2.1 QD Defined

QD relationships are based on levels of risk considered acceptable for specific exposures. These relationships are tabulated in applicable QD tables.

- These separation distances do **not** provide absolute safety or protection.
- **Greater** distances than those in the QD tables should be used if possible.

NEWQD	IBD From:				PTRD From:			
	ECM			Other	ECM			Other
	Front[1,2]	Side[1]	Rear[3]	PES[4]	Front[5,6]	Side[5]	Rear[5]	PES[5]
(lbs)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(ft)
[kg]	*[m]*	*[m]*	*[m]*	*[m]*	*[m]*	*[m]*	*[m]*	*[m]*
1	500	250	250	NOTE 4	300	150	150	NOTE 5
0.45	*152.4*	*76.2*	*76.2*		*91.4*	*45.7*	*45.7*	
1.5	500	250	250		300	150	150	
0.68	*152.4*	*76.2*	*76.2*		*91.4*	*45.7*	*45.7*	

Excerpt of a QD Table

2.2 Determining Safe Separation Distanc

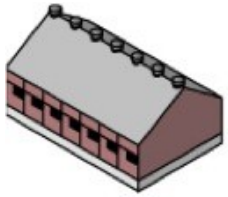
2. 3. The type of exposure for the ES (i.e., the amount of protection to be provided for the ES)

Barricades

2.2 Types of Exposures

External Exposure

1. Inhabited Building Distance (IBD)

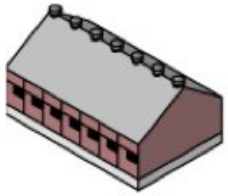


Above ground magazine

Distance to be maintained between a PES and an inhabited building

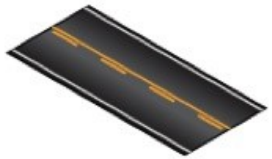
Inhabited building

Public Traffic Route Distance (PTRD)



Above ground magazine

Distance to be maintained between a PES and any public street, road, highway, navigable stream or passenger railroad



Public street

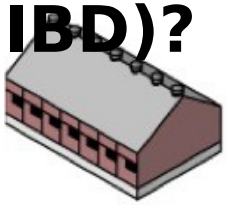
2.2 Inhabited Building Distance

What are inhabited buildings?

Structures, other than **Ammunition and Explosives (AE)** related buildings, occupied by personnel or the general public, both within and outside DOD establishments

Inhabited building

What is Inhabited Building Distance (IBD)?



Above ground magazine

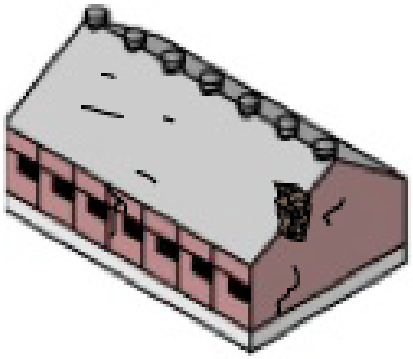
Distance maintained between a PES and an inhabited building

Inhabited building

IBD applies to civilian and military personnel.

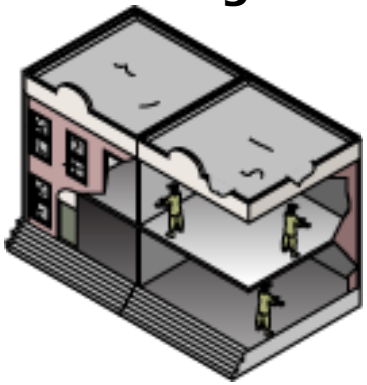
2.2 IBD Effects

Unstrengthened Buildings



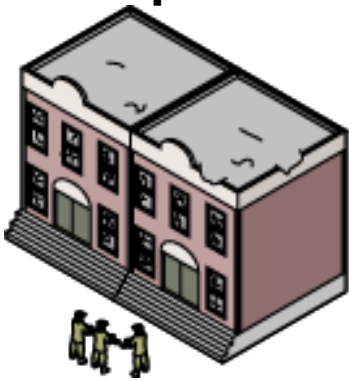
Expected to sustain damage approximating 5% of replacement cost

Persons inside Buildings



Expected to be protected from death or serious injury

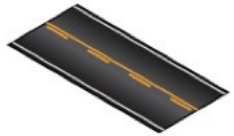
Persons in the Open



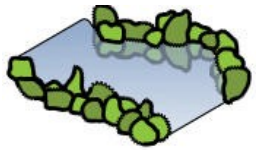
Not expected to be killed or seriously injured by blast effects

2.2 Public Traffic Route Distance

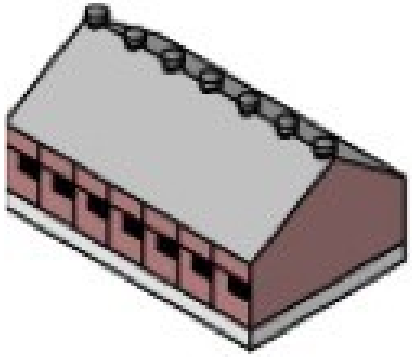
What is **Public Traffic Route Distance (PTRD)**?



Street, road or highwa

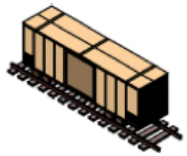


Navigable stream



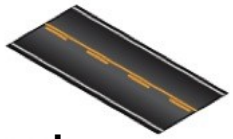
PES

Distance maintained between a **PES** and any public street, road, highway, navigable stream or passenger railroad



Passenger railroad

Frag Video 50,000 lbs

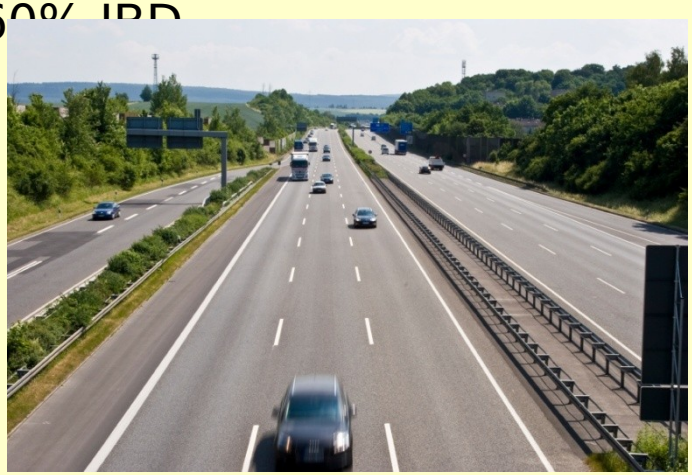


Roads on a military reservation used by the general public

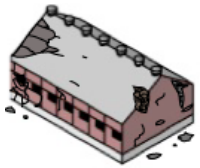
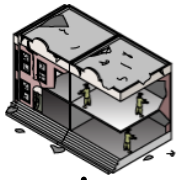
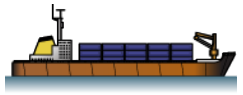
2.2 Public Traffic Route Distance, cont

H **Medium Traffic Density:** On-base roads require this level of protection

- Between 400 and 10,000 car or rail passengers per day
- Between 80 and 2,000 ship passengers per day
- Requires 60% IBD

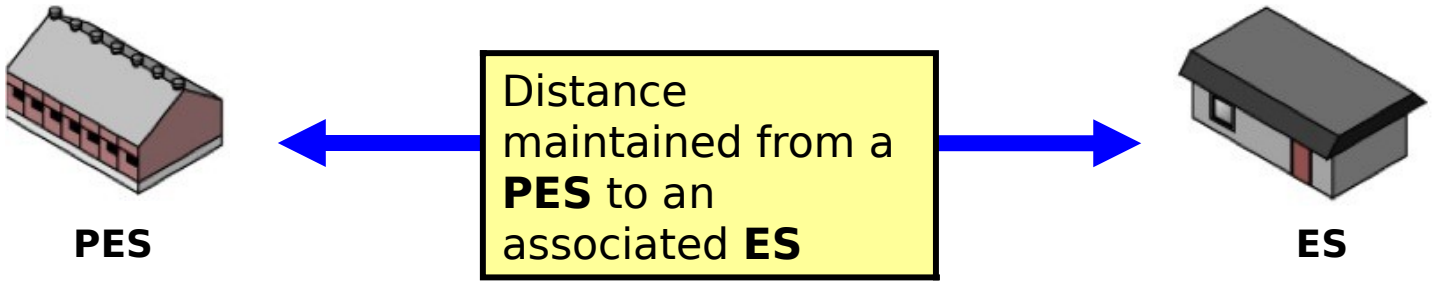


2.2 PTRD Effects

Unstrengthened Buildings	Persons Inside Buildings	Persons in the Open	Aircraft	Vehicles on the Road	Cargo-type Ships
					
Expected to sustain damage approx. 20% of replacement cost	May suffer temporary hearing loss or injury	Not expected to be killed or seriously injured by blast effects	Some damage to the fuselage from blast	Little damage, unless hit by a fragment or momentary loss of control	Minor damage to deck structure and exposed electronics

2.2 Intraline Distance

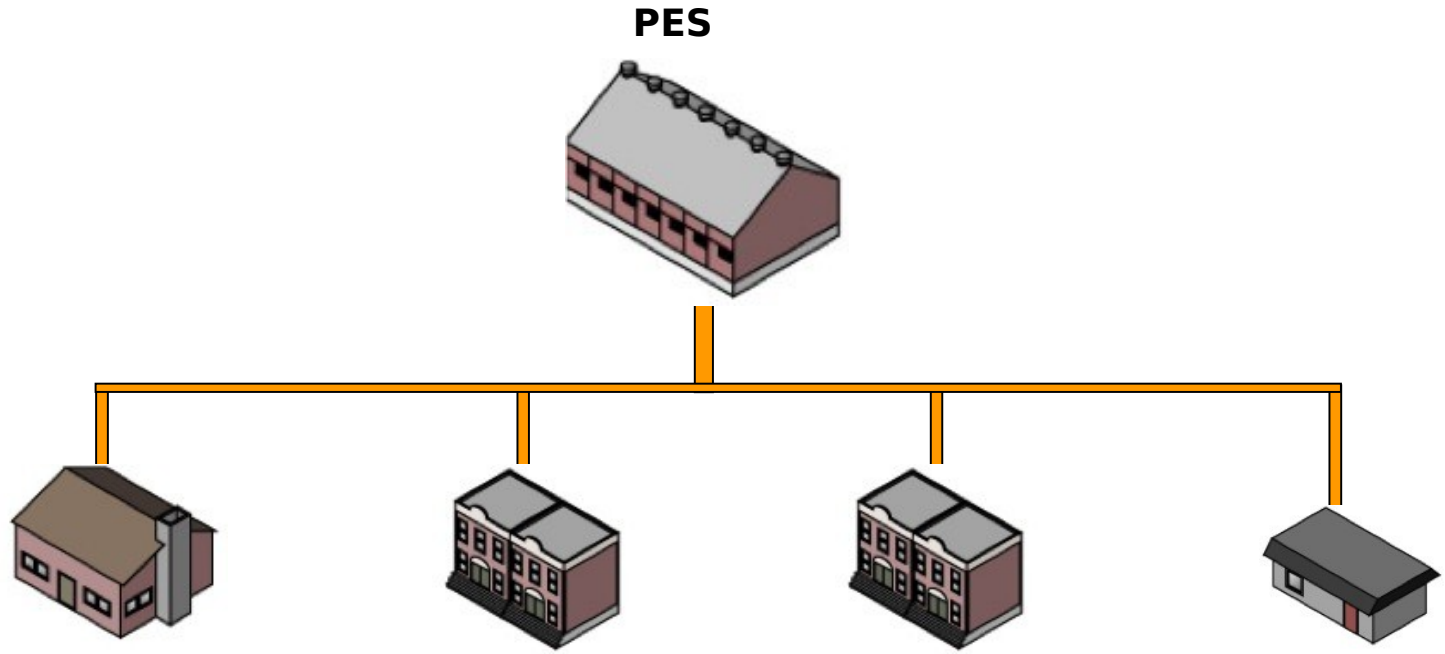
What is **Intraline Distance (ILD)**?



ILD can be barricaded (B) or unbarricaded (U).

Because there are limited applications for **ILD(B)**, this presentation will discuss only **ILD(U)**.

2.2 PES to ES Relationships



Buildings for comfort, safety or convenience used exclusively in support of the PES

- Lunchroom
- Ammo area motor pools
- Auxiliary fire stations

Operational support buildings used exclusively by personnel operating the PES

- Day rooms
- Operations offices

Training facilities used exclusively by personnel operating the PES

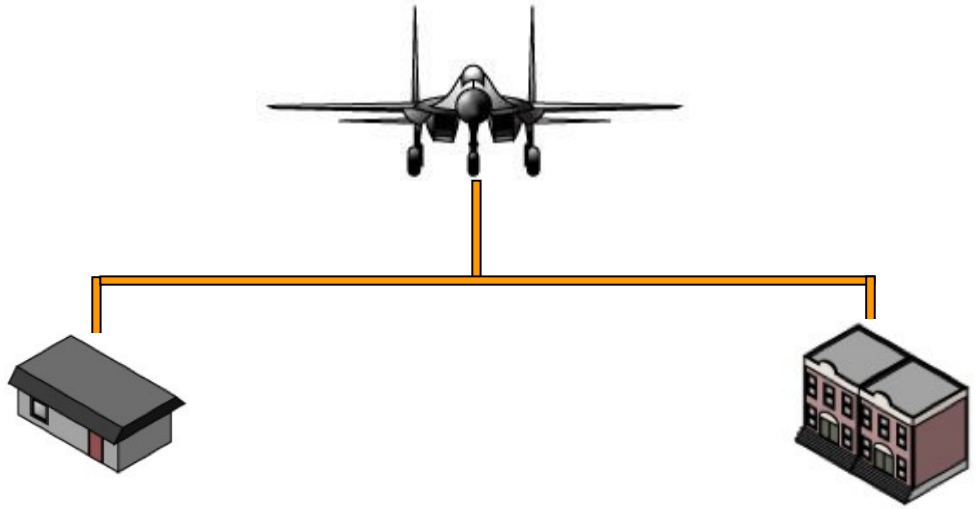
- Classrooms
- Forklift training area

Ammunition operations facilities related to the PES

- Surveillance
- Shipping/receiving
- Inspection
- Maintenance
- Unpack/repack

2.2 Combat Aircraft Support Facilities

Such facilities include:



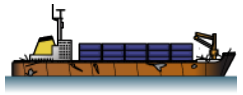
Operating facilities that:

- Handle AE on the flightline
- Prepare and service armed aircraft
- House personnel who fly combat aircraft

Direct flightline combat aircraft associated facilities that may contain:

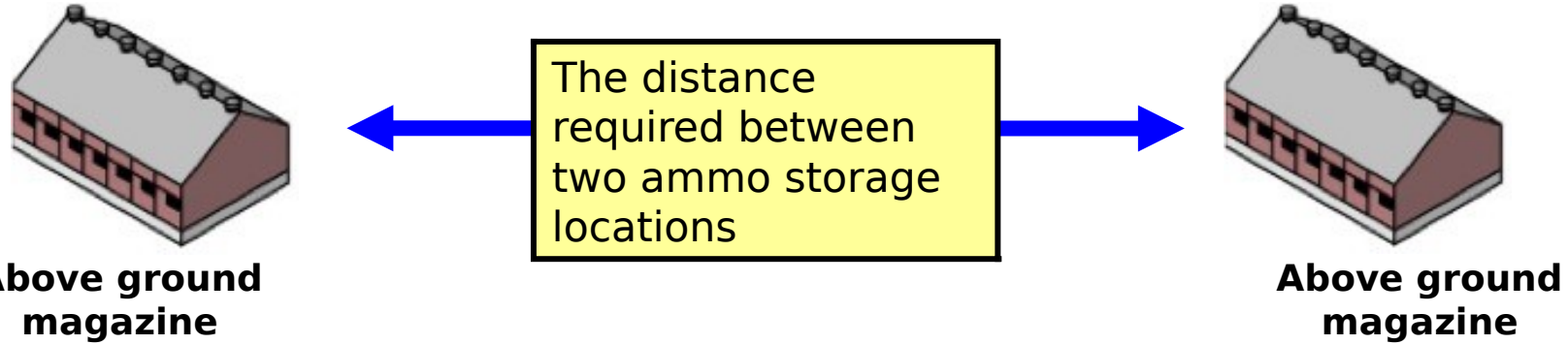
- Field offices
- Break rooms
- Unit training rooms
- Equipment and supply rooms
- Petroleum, Oils, Lubricants (POL)
- Hydrant facilities
- Civil engineer fire protection stations

2.2 ILD Effects

PES	Unstrengthened Buildings	Persons in the Open	Aircraft	Transport Vehicles	Cargo-type Ships
					
Direct propagation to other PESs is not expected Delayed propagation is possible	Expected to sustain damage approx. 50% of replacement cost	May suffer serious injuries Fatalities are possible	Significant structural damage from blast	Extensive, but not severe, body and glass damage	Fragment and overpressure damage possible

2.2 Intermagazine Distance

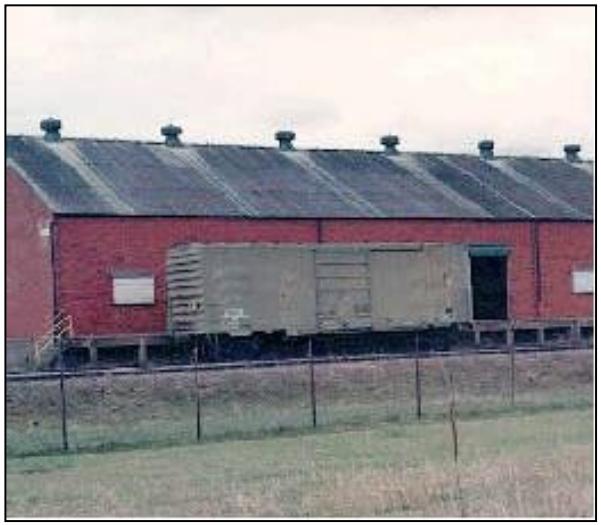
What is **Intermagazine Distance (IMD)**?



This type of separation is used to prevent explosive propagation from one location to another.

2.2 IMD Criteria

There are two different criteria for **IMD**:



Above Ground Magazine (AGM)

Earth Covered Magazine (ECM)

2.2 AGMs

Since most tactical situations do not involve ECMs, this course will discuss only AGMs (barricaded or unbarricaded) which include:

MILVAN/ISO containers

Open storage sites

Storage in structures other than ECMs

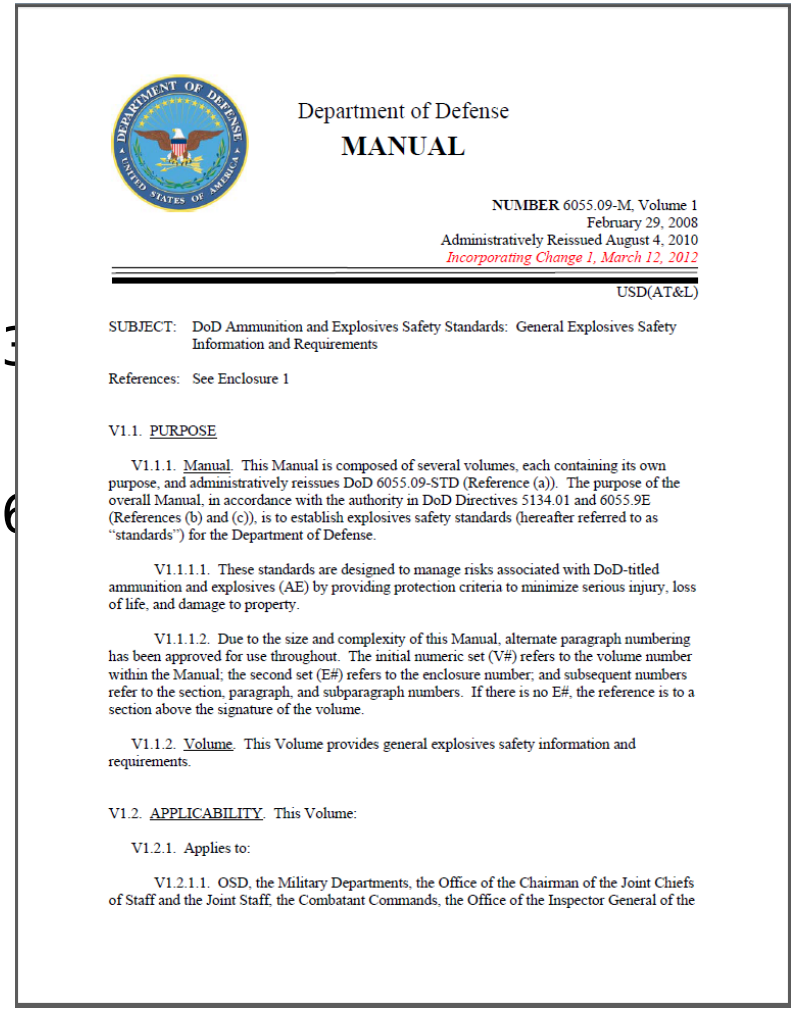
2.2 IMD (U) Effects

PES	Unstrengthened Buildings	Persons in the Open	Aircraft	Transport Vehicles	Cargo-type Ships
Direct propagation to other PESs is not expected Delayed propagation is possible	Damage approaching total destruction	Serious injuries likely	Heavy damage and destruction likely	Severe body damage, minor engine damage and total glass breakage	Extensive damage likely Delayed propagation may occur

2.3 Determining Safe Separation Distanc

Two criteria that can be used in a tactical environment:

- DoDM 6055.09-M, Volume 3 "Peacetime Standards"
- DoDM 6055.09-M, Volume 6 "Contingency Standards"



Department of Defense
MANUAL

NUMBER 6055.09-M, Volume 1
February 29, 2008
Administratively Reissued August 4, 2010
Incorporating Change 1, March 12, 2012

USD(AT&L)

SUBJECT: DoD Ammunition and Explosives Safety Standards: General Explosives Safety Information and Requirements

References: See Enclosure 1

V1.1. PURPOSE

V1.1.1. Manual. This Manual is composed of several volumes, each containing its own purpose, and administratively reissues DoD 6055.09-STD (Reference (a)). The purpose of the overall Manual, in accordance with the authority in DoD Directives 5134.01 and 6055.9E (References (b) and (c)), is to establish explosives safety standards (hereafter referred to as "standards") for the Department of Defense.

V1.1.1.1. These standards are designed to manage risks associated with DoD-titled ammunition and explosives (AE) by providing protection criteria to minimize serious injury, loss of life, and damage to property.

V1.1.1.2. Due to the size and complexity of this Manual, alternate paragraph numbering has been approved for use throughout. The initial numeric set (V#) refers to the volume number within the Manual; the second set (E#) refers to the enclosure number; and subsequent numbers refer to the section, paragraph, and subparagraph numbers. If there is no E#, the reference is to a section above the signature of the volume.

V1.1.2. Volume. This Volume provides general explosives safety information and requirements.

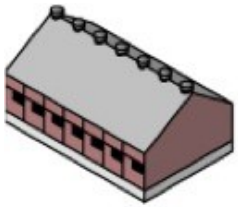
V1.2. APPLICABILITY. This Volume:

V1.2.1. Applies to:

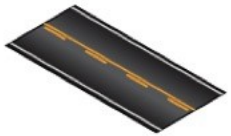
V1.2.1.1. OSD, the Military Departments, the Office of the Chairman of the Joint Chiefs of Staff and the Joint Staff, the Combatant Commands, the Office of the Inspector General of the

2.3 Contingency Distances

Asset Preservation Distance



Asset preservation distance is **PTRD or greater**.



PES

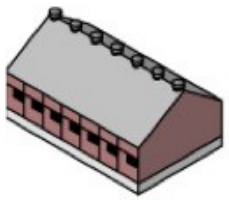
Airfield, street, road or highway

What you need to know:

- Asset preservation distance provides greater protection for assets deemed sufficiently critical to warrant the greater protection.
- This separation distance should prevent propagation between PESs.
- At this distance from the PES, **assets at the ES are expected to be usable and mission capability is maintained following an incident.**

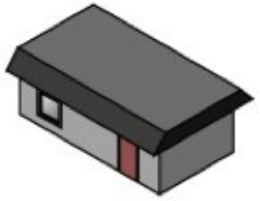
2.3 Contingency Distances, cont.

Minimum Separation Distance



PES

Minimum separation distance is used when you are only trying to **prevent propagation** from explosives.



Operating building

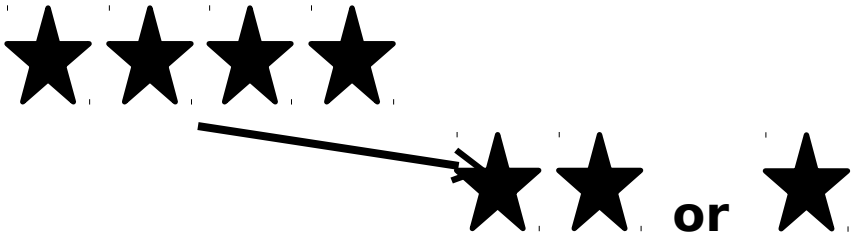
What you need to know:

- Minimum separation distance provides lesser protection for those assets which the mission requirements outweigh the increased risk to those assets.
- This separation distance should prevent prompt propagation; however, delayed propagation between PESs is possible.
- At this distance from the PES, **mission capability will likely be impaired or delayed.**

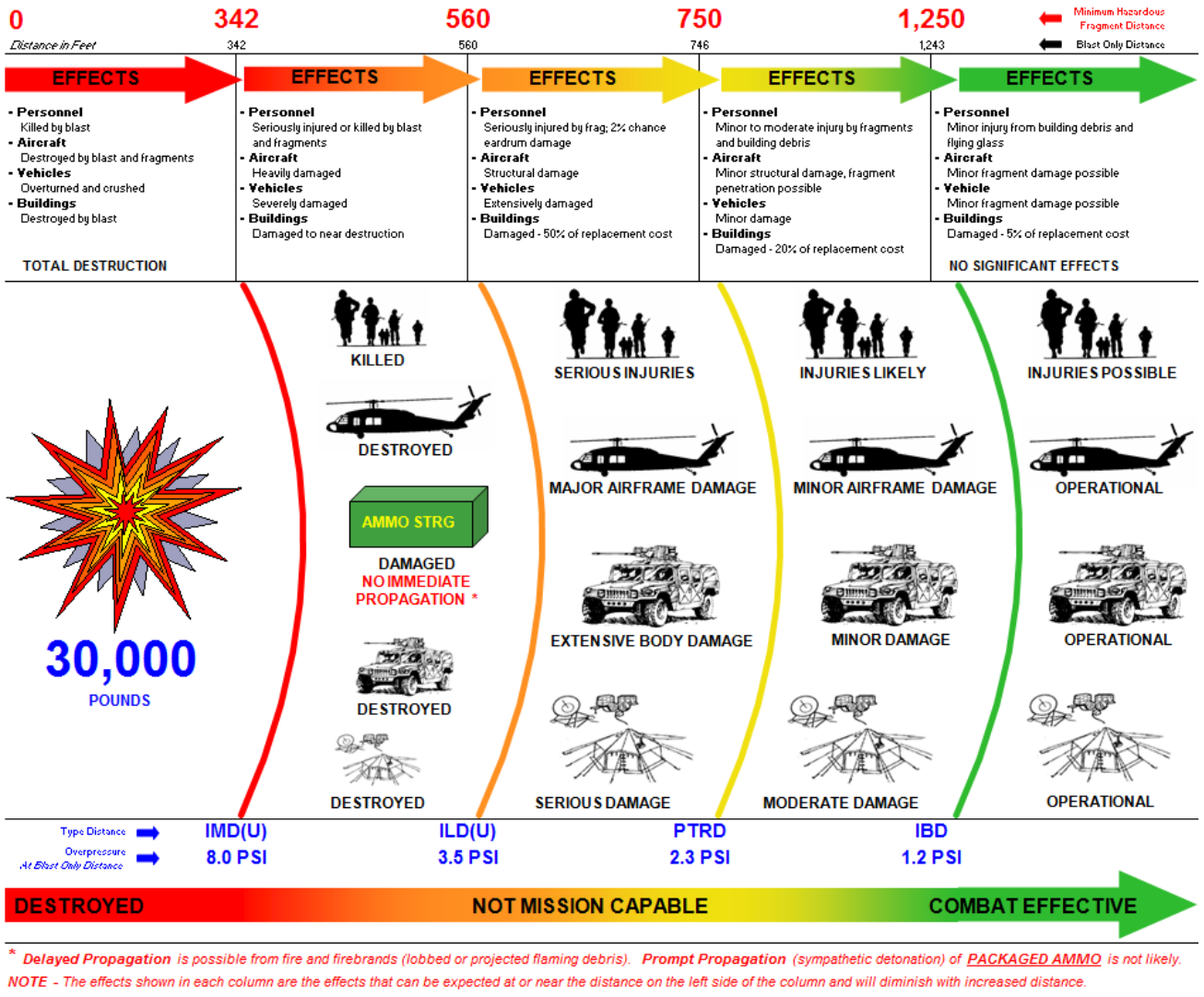
2.3 Who Designates Contingency Distances

Only the Commanders of the Combatant Commands or the US Commander of a Joint Task Force (JTF) shall designate the DoD Component's explosives safety criteria to be used.

When necessary, these Commanders may delegate certain explosives safety responsibilities to designated subordinate commanders to ensure appropriate controls.



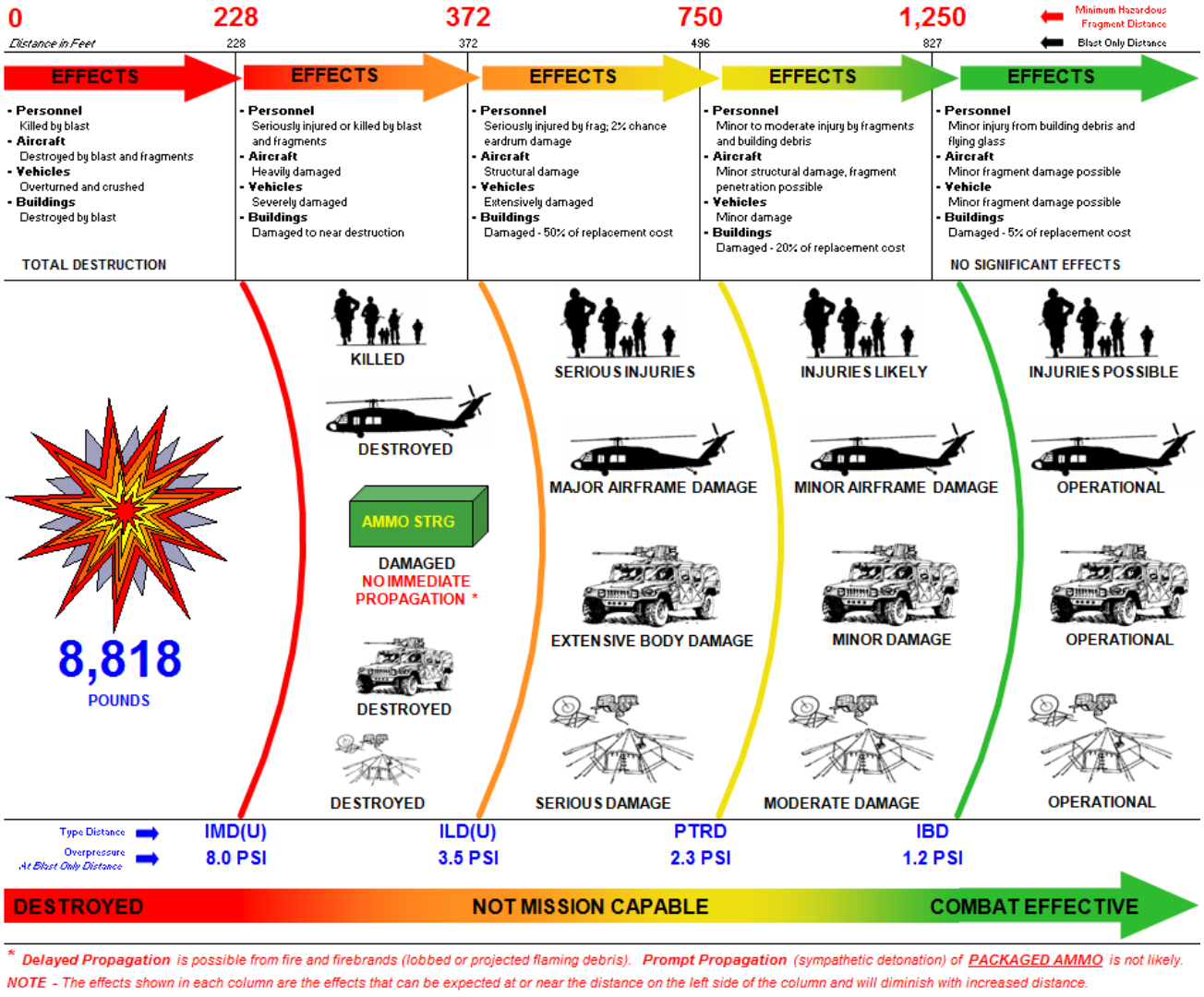
2.3 Safe Separation Distance – 30,000



* ***Delayed Propagation*** *is possible from fire and firebrands (lobbed or projected flaming debris).* ***Prompt Propagation*** *(sympathetic detonation) of* ***PACKAGED AMMO*** *is not likely.*

NOTE *- The effects shown in each column are the effects that can be expected at or near the distance on the left side of the column and will diminish with increased distance.*

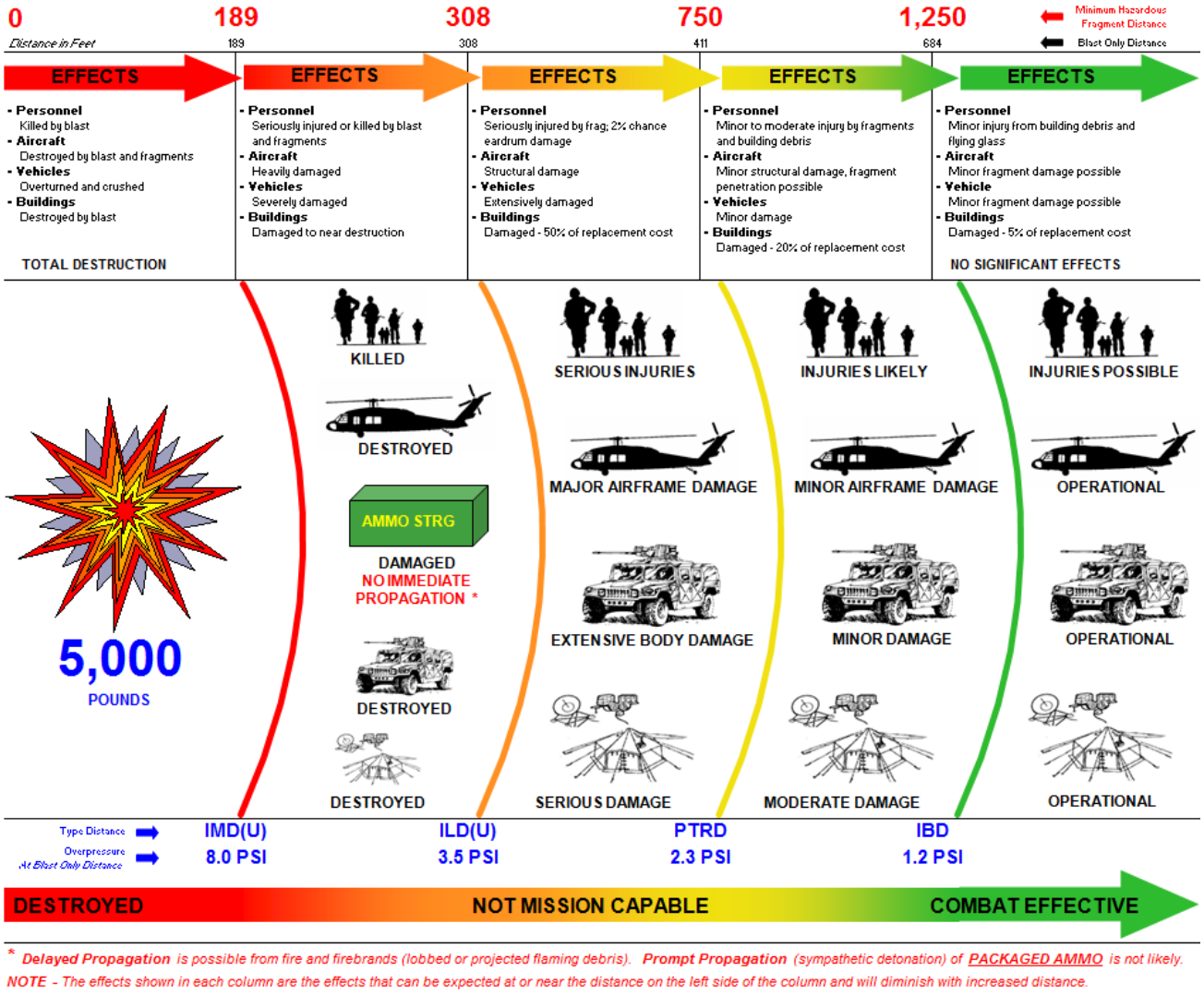
2.3 Safe Separation Distance – 8,818 l



* ***Delayed Propagation*** *is possible from fire and firebrands (lobbed or projected flaming debris).* ***Prompt Propagation*** *(sympathetic detonation) of* ***PACKAGED AMMO*** *is not likely.*

NOTE *- The effects shown in each column are the effects that can be expected at or near the distance on the left side of the column and will diminish with increased distance.*

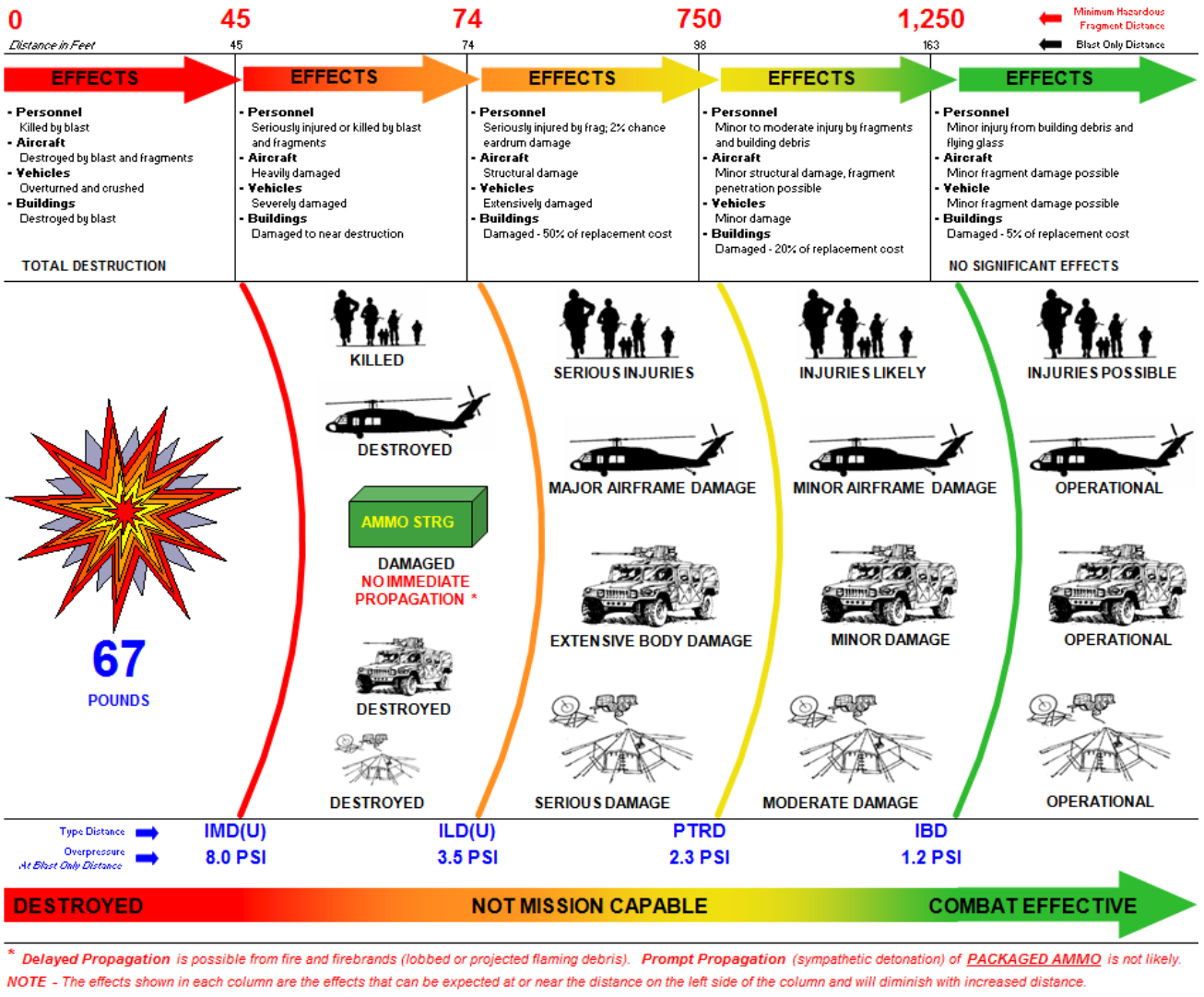
2.3 Safe Separation Distance – 5,000 l



* ***Delayed Propagation*** *is possible from fire and firebrands (lobbed or projected flaming debris).* ***Prompt Propagation*** *(sympathetic detonation) of* ***PACKAGED AMMO*** *is not likely.*

NOTE *- The effects shown in each column are the effects that can be expected at or near the distance on the left side of the column and will diminish with increased distance.*

2.3 Safe Separation Distance – 67 lb



* ***Delayed Propagation*** *is possible from fire and firebrands (lobbed or projected flaming debris).* ***Prompt Propagation*** *(sympathetic detonation) of* ***PACKAGED AMMO*** *is not likely.*

NOTE *- The effects shown in each column are the effects that can be expected at or near the distance on the left side of the column and will diminish with increased distance.*

2.4 Barricades

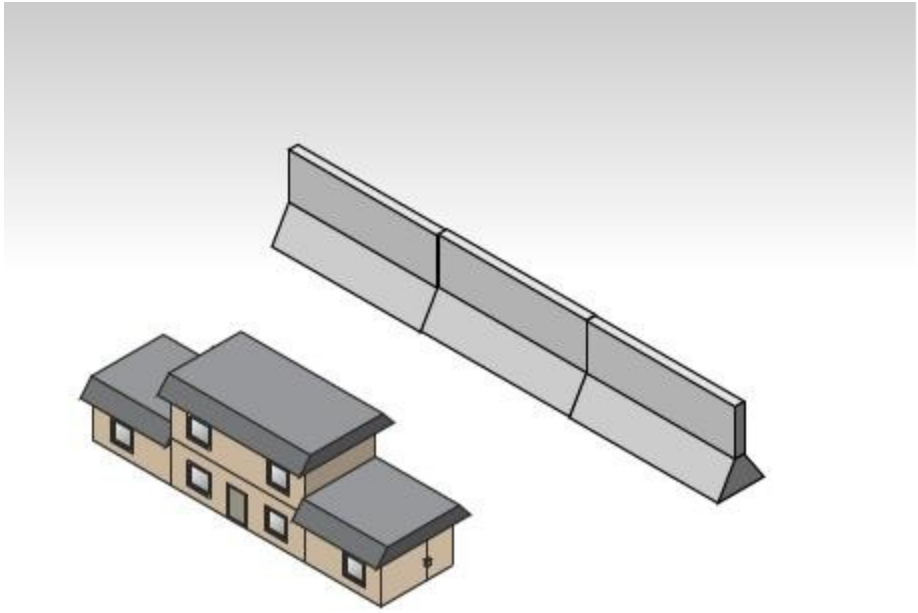
Barricades are designed to:

- Stop high speed, low angle fragments
  - These high speed fragments have sufficient energy to initiate ammo items in nearby storage sites.
- Prevent propagation (from heat and shock) between storage sites

HESCO barricades

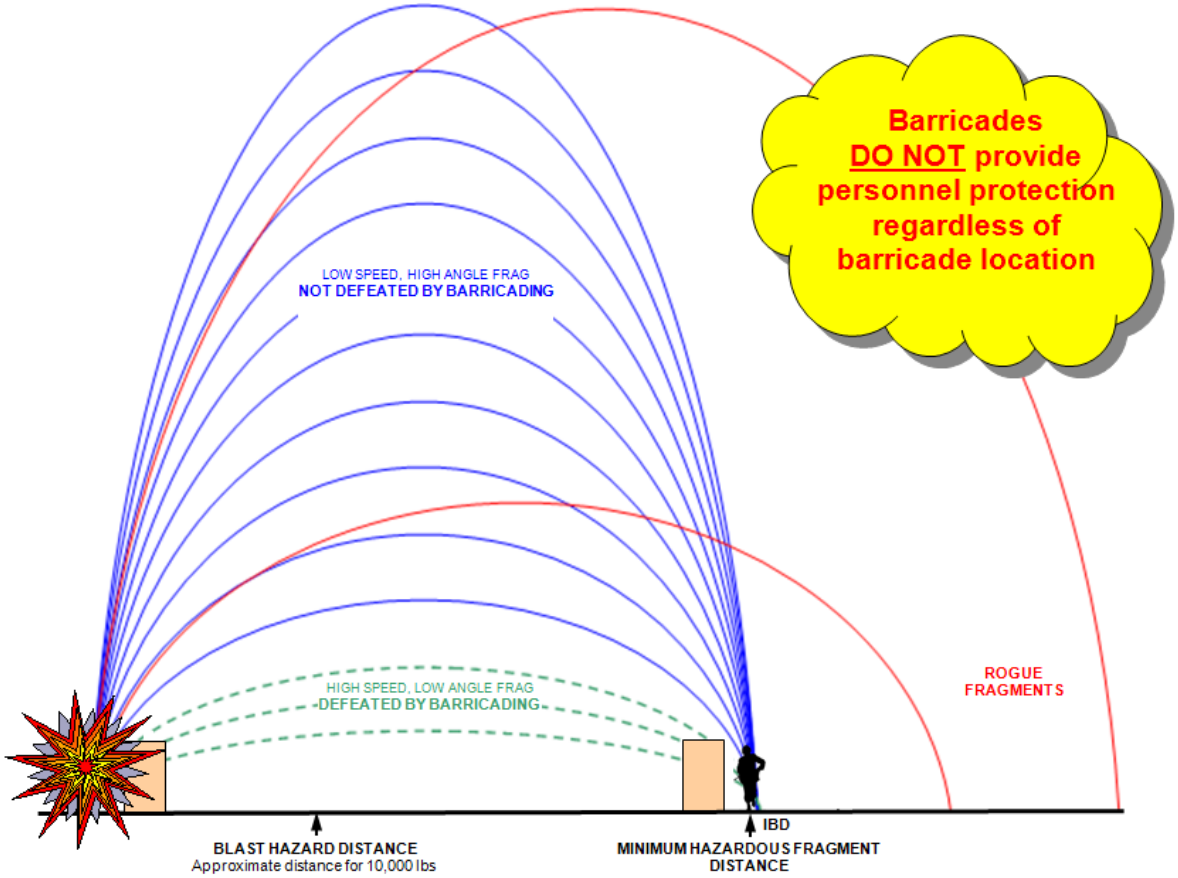
2.4 What Do Barricades Protect?

BARRICADES DO NOT PROVIDE PERSONNEL PROTECTION.



Play Animation

2.4 Barricades, cont.



HAZARDOUS FRAGMENT - a fragment having an impact energy of 58 ft-lbs or greater. This 58 ft-lb impact energy was determined to be the energy required to take a soldier out of action (very likely a fatality).

MINIMUM HAZARDOUS FRAGMENT DISTANCE - the distance at which the areal density of hazardous fragments or debris becomes one per 600 ft². At this distance, there is a 1% probability of a person being hit by a hazardous fragment (1% Lethality Distance).

ROGUE FRAGMENT - a Hazardous Fragment projected beyond the Minimum Hazardous Fragment Distance distance (i.e. to a distance at which the areal density of hazardous fragments or debris is less than one per 600 ft²).

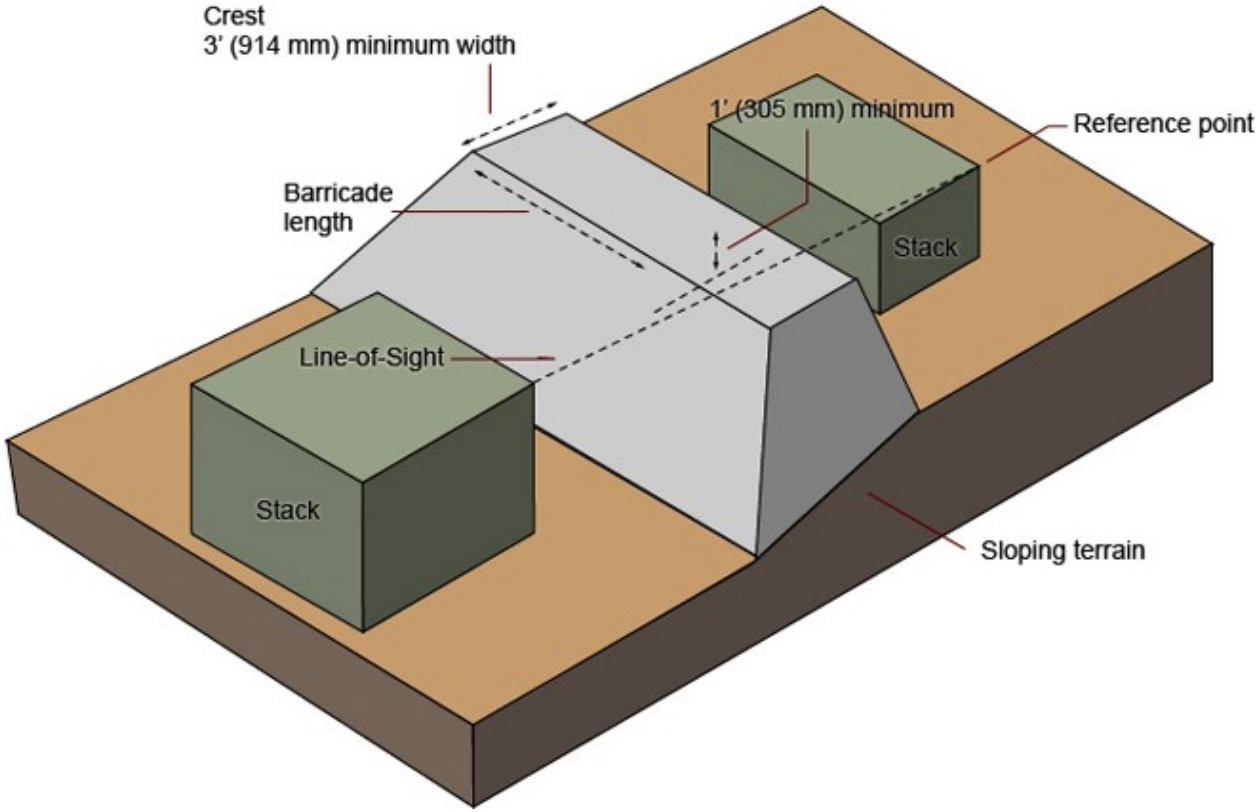
2.4 Barricade Types

Barricades must meet certain specifications to provide adequate protection.
There are three basic types of barricades:

1. Earthen Berm
2. Steel Bin Barricades
3. HESCO Concertainers

2.4 Earthen Berm Barricades

DoDM 6055.09-M, V2.E5.4.3.2. The slope of an earthen barricade must be two horizontal to one vertical, unless erosion controls are used.



2.4 Steel Bin Barricades

Two types of steel bin barricades:

1. Type A revetments:

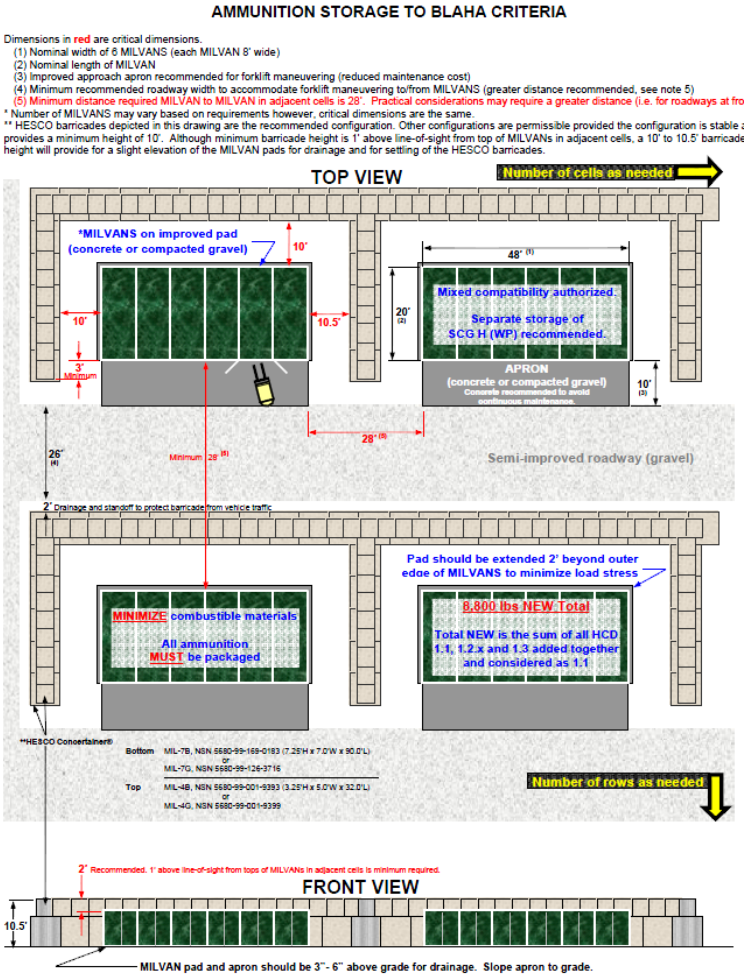
- Minimum of 7 ft (2.1 m) thick
- Cannot exceed 30,000 lb NEW

2. Type B revetments:

- Minimum of 5.25 ft (1.6 m) thick
- Cannot exceed 5,000 lb NEW

Steel bin barricades

2.4 HESCO Barricades


AMMUNITION STORAGE TO BLAHA CRITERIA
Dimensions in red are critical dimensions.
(1) Nominal width of 6 MILVANS (each MILVAN 8' wide)
(2) Nominal length of MILVAN
(3) Improved approach apron recommended for forklift maneuvering (reduced maintenance cost)
(4) Minimum recommended roadway width to accommodate forklift maneuvering to/from MILVANS (greater distance recommended, see note 5)
(5) Minimum distance required MILVAN to MILVAN in adjacent cells is 28'. Practical considerations may require a greater distance (i.e. for roadways at front).
* Number of MILVANS may vary based on requirements however, critical dimensions are the same.
** HESCO barricades depicted in this drawing are the recommended configuration. Other configurations are permissible provided the configuration is stable and provides a minimum height of 10'. Although minimum barricade height is 1' above line-of-sight from top of MILVANs in adjacent cells, a 10' to 10.5' barricade height will provide for a slight elevation of the MILVAN pads for drainage and for settling of the HESCO barricades.
TOP VIEW
Number of cells as needed
*MILVANS on improved pad (concrete or compacted gravel)
10'
10'
10.5'
48" (1)
20' (2)
Mixed compatibility authorized
Separate storage of SCG H (WP) recommended.
APRON (concrete or compacted gravel)
Concrete recommended to avoid continuous maintenance.
10' (3)
3" Minimum
28" (5)
26" (4)
Minimum 28' (5)
Semi-improved roadway (gravel)
2' Drainage and standoff to protect barricade from vehicle traffic
Pad should be extended 2' beyond outer edge of MILVANS to minimize load stress
MINIMIZE combustible materials
All ammunition MUST be packaged
8,800 lbs NEW Total
Total NEW is the sum of all HCD 1.1, 1.2.x and 1.3 added together and considered as 1.1
**HESCO Concertainer®
Bottom MIL-7B, NSN 5680-99-169-0183 (7.25'H x 7.0'W x 90.0'L) or MIL-7G, NSN 5680-99-126-3716
Top MIL-4B, NSN 5680-99-001-9393 (3.25'H x 5.0'W x 32.0'L) or MIL-4G, NSN 5680-99-001-9399
Number of rows as needed
2' Recommended. 1' above line-of-sight from tops of MILVANs in adjacent cells is minimum required.
FRONT VIEW
10.5'
MILVAN pad and apron should be 3"- 6" above grade for drainage. Slope apron to grade.

HESCO barricades may only be used for 8,818 lb NEW maximum.

2.4 HESCO Barricaded Ammo Storage Sche

2.5 Bulk Fuel Storage

Bulk fuel storage should be diked and located down slope from ammo.

Stored fuel

2.5 Bulk Fuel Storage Distances

QTY (gals)	DIST (ft)
500	50
500 - 5,000	100
> 5,000	IBD

Workshop Focus – Topic 3

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

Camp Doha, Kuwait, 11 July 1991

Causes:

- FAASV heater fire
- Uploaded vehicles closely grouped

Assets lost:

- 4 Abrams tanks
- 7 M109 Howitzers
- 7 FAASVs
- 4 AVLBs
- 40 smaller vehicles (HMMWVs, CUCVs, etc.)

Human cost:

- 3 fatalities during clean-up
- 50 injuries initially

Total value of assets lost was over $40 million.

Camp Doha, cont.

Camp Doha, cont.

Camp Doha, cont.

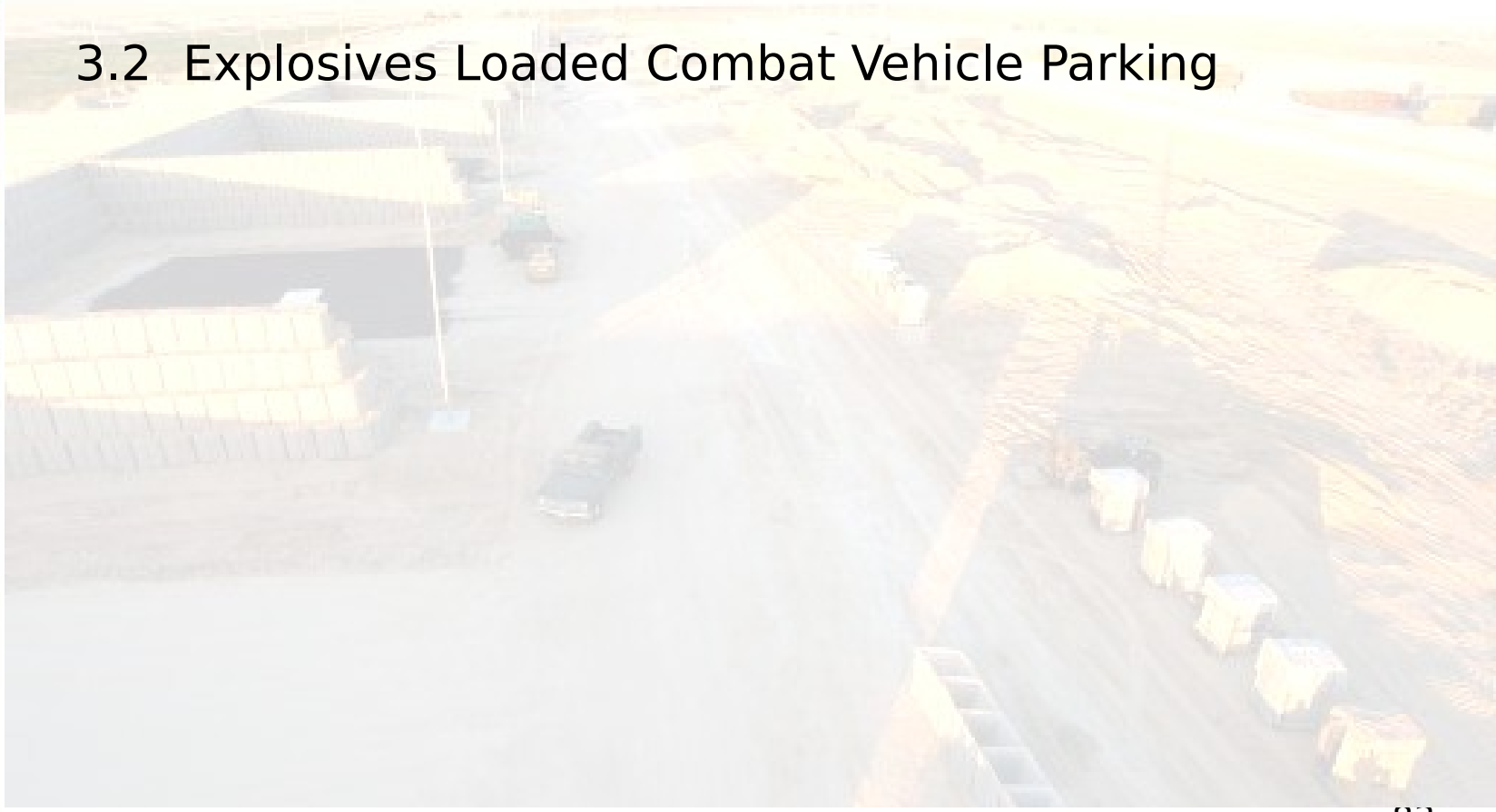
Camp Doha, cont.

Topic 3 Explosives Loaded Combat Vehicle Parking

This section will discuss the following:

3.1 Armored Vehicles

3.2 Explosives Loaded Combat Vehicle Parking

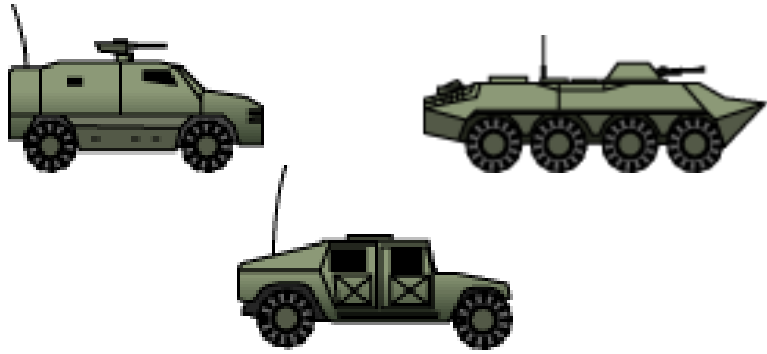


3.1 Armored Vehicles

Light armor vehicles are capable of stopping a hazardous fragment from entering but **<u>are not capable</u>** of containing a blast from inside.

Examples of light armor vehicles:

- MRAPs (mine resistant ambush protected)
- Strykers
- JERRVs



Heavy armor vehicles **<u>are capable</u>** of containing a blast from inside.

Currently, the only example of a heavy armored vehicle is the Abrams tank.

3.2 Explosives Loaded Combat Vehicle Parking

NEW (lbs) [kg]	D1[1] (ft) [m]	D2[2] (ft) [m]	D3[3] (ft) [m]	D4[4] (ft) [m]	D5[5] (ft) [m]	D6[6] (ft) [m]
10	4	13	26	591	886	66
4.5	*1.3*	*3.9*	*7.9*	*180*	*270*	*20*
15	5	15	30	591	886	66
6.8	*1.5*	*4.5*	*9.0*	*180*	*270*	*20*
20	5	16	33	591	886	
9.1	*1.7*	*5.0*	*9.9*	*180*	*270*	*20*
30	6	19	37	591	886	66
13.6	*1.9*	*5.7*	*11.4*		*270*	*20*
50	7	22	44	591	886	66
22.7	*2.2*	*6.7*	*13.5*	*180*	*270*	*20*
70	8		49	591	886	66
31.8	*2.5*	*7.5*	*15.1*	*180*	*270*	
100	9	28	56	591	886	66
45.4	*2.8*	*8.5*	*17.0*	*180*	*270*	*20*
150	11	32	64	591		81
68.0	*3.2*	*9.7*	*19.4*	*180*	*270*	*24.6*
200	12	35	70	591	886	99
90.7	*3.6*	*10.7*	*21.4*	*180*	*270*	*30.0*
300	13	40	80	591	886	130
136.1	*4.1*	*12.2*	*24.5*	*180*	*270*	*39.6*
500	16	48	95	591	886	
226.8	*4.8*	*14.5*	*29.0*	*180*	*270*	
700	18	53	107	591	886	
317.5	*5.4*	*16.2*	*32.5*	*180*	*270*	
1,000	20	60	120	591	886	
453.6	*6.1*	*18.3*	*36.6*	*180*	*270*	
1,500	23	69	137	591	886	
680.4	*7.0*	*20.9*	*41.9*	*180*	*270*	
2,000	25	76	151	591	886	
907.2	*7.7*	*23.0*	*46.1*	*180*	*270*	
3,000	29	87	173	591	886	
1,360.8	*8.8*	*26.4*	*52.8*	*180*	*270*	
5,000	34	103	205	591	886	
2,268.0	*10.4*	*31.3*	*62.5*	*180*	*270*	
7,000	38	115	230	669	1021	
3,175.1	*11.7*	*35.0*	*70.0*	*204.0*	*306.0*	
8,818	41	124	248	751	1146	
4,000	*12.6*	*37.8*	*75.6*	*229.0*	*343.4*	

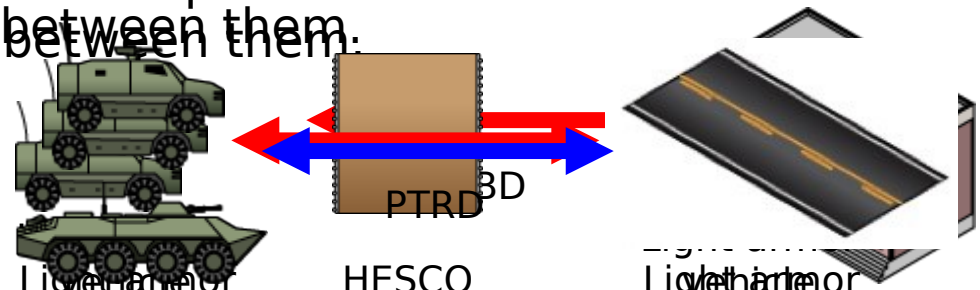
DoDM 6055.09, Table V6.E3.T1:

D1: Distance between two non-armored or light armor vehicles when an adequate barricade is located between them.

D4: PTRD from an armored vehicle to an inhabited building

D5: PTRD from a non-armored vehicle to an inhabited building

D6: PTRD from a non-armored vehicle to a public traffic route



Light armor vehicles

Workshop Focus – Topic 4

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP)

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

Topic 4 FARP

This section will discuss the following:

4.1 Forward Arming and Refueling Point (FARP) Defined

4.2 Refueling/Rearming Pads

4.3 Ready Ammunition Storage Area (RASA)

4.4 Ammunition Holding Area (AHA) and Fuel Storage

4.5 FARP, PTRD and IBD

4.1 What is a FARP?

A **forward arming and refueling point (FARP)** is a temporary arming and refueling facility that an aviation unit commander organizes, equips and deploys to support combat

FARP with a HESCO barricade

4.1 What is a FARP?, cont.

FARPs have four areas that require explosives safety consideration:

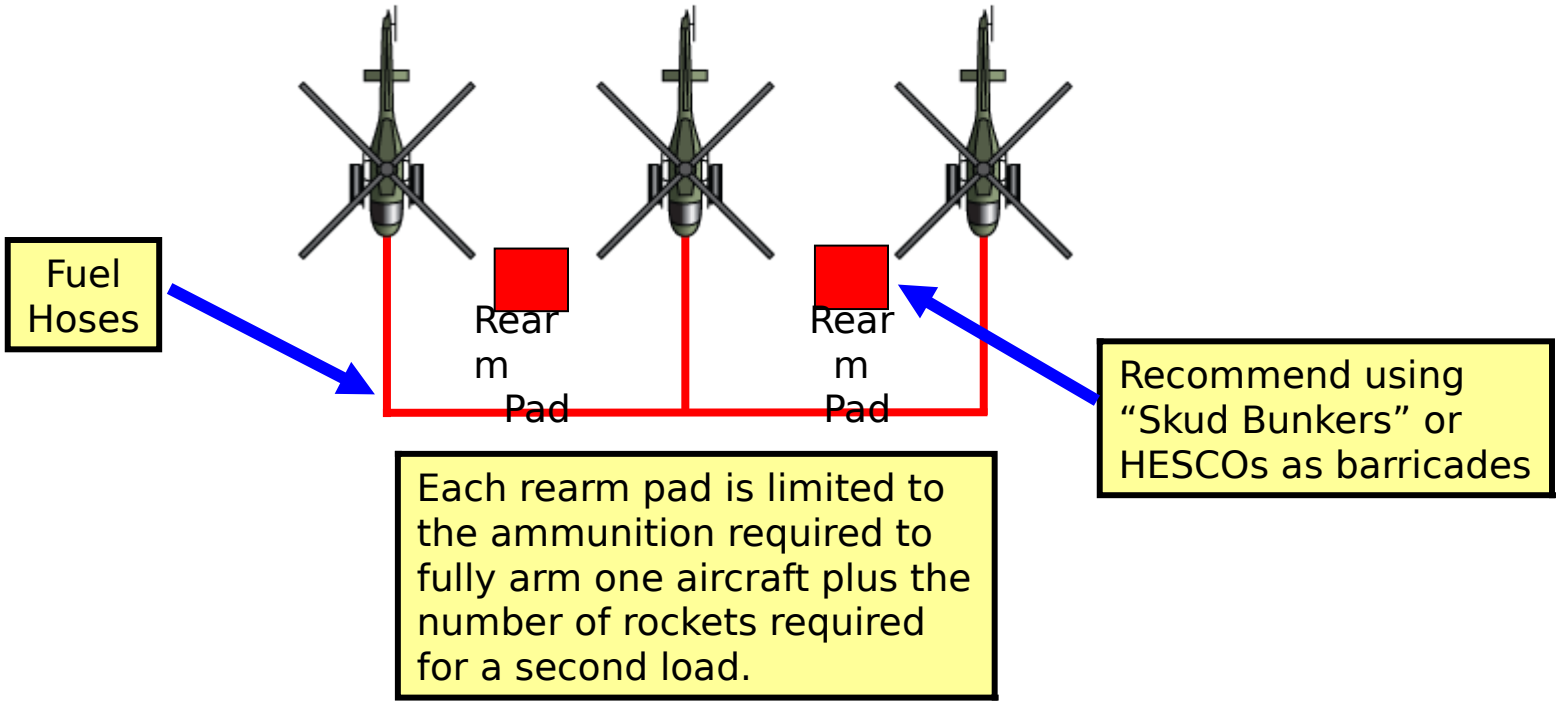
- Refueling/Rearming Pads
- Ready Ammunition Storage Area (RASA)
- Ammunition Holding Area (AHA)
- Fuel Storage

Refueling at a FARP

FARP

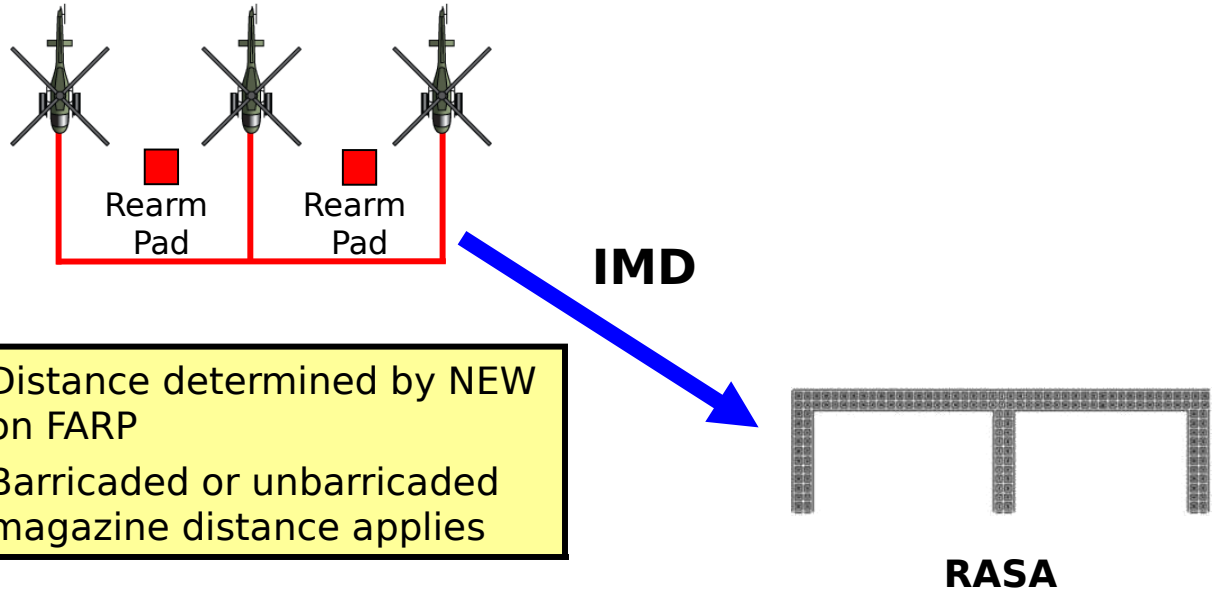
4.2 Refueling/Rearming Pads

Refueling/rearming pads are the designated landing areas for rotary wing aircraft.


Fuel Hoses
Rearm Pad
Rearm Pad
Recommend using "Skud Bunkers" or HESCOs as barricades
Each rearm pad is limited to the ammunition required to fully arm one aircraft plus the number of rockets required for a second load.

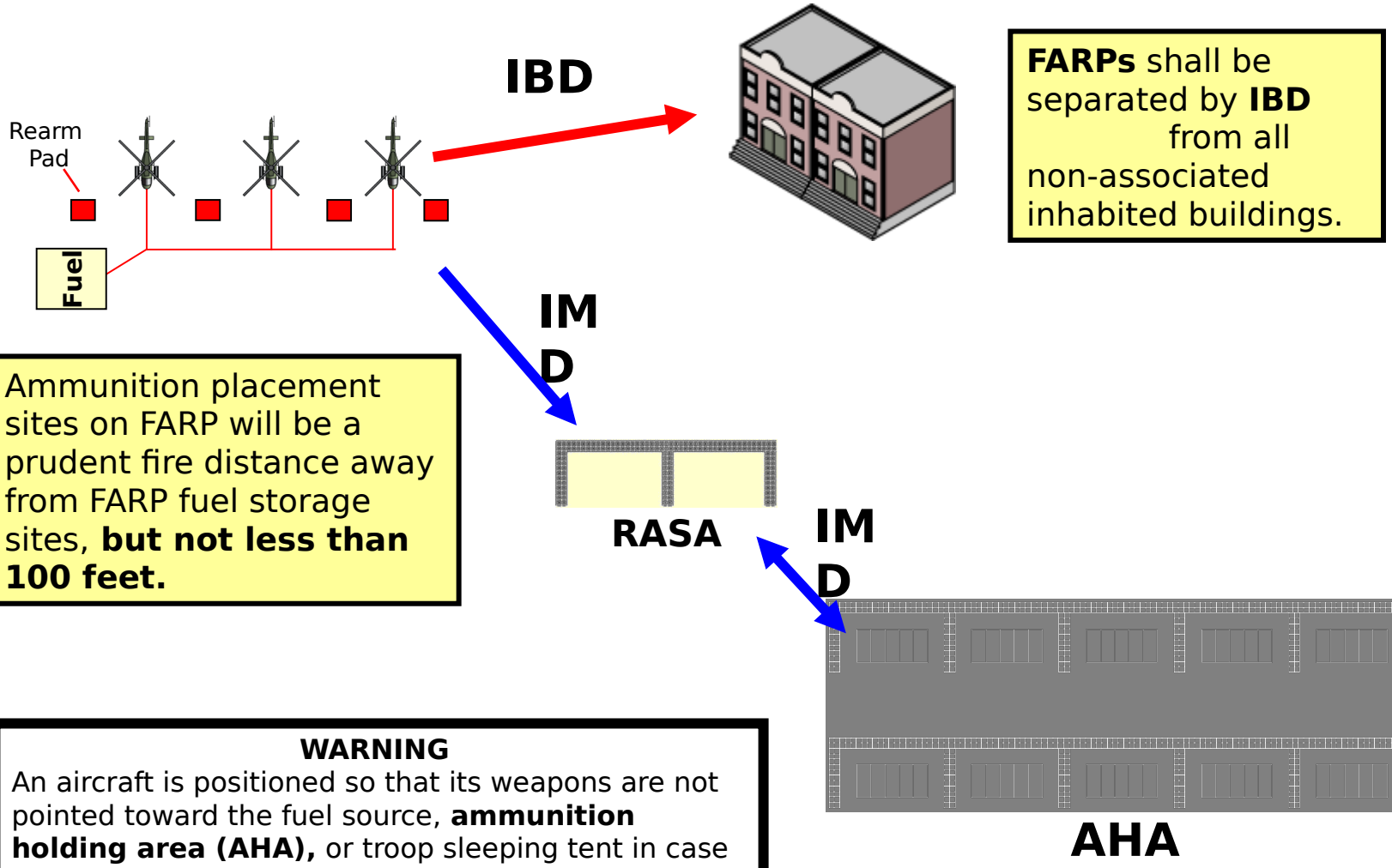
4.3 Ready Ammunition Storage Area

The **ready ammunition storage area (RASA)** contains the ammunition required to support the arming of aircraft.



- Distance determined by NEW on FARP
- Barricaded or unbarricaded magazine distance applies

4.4 Ammunition Holding Area and Fuel Storage



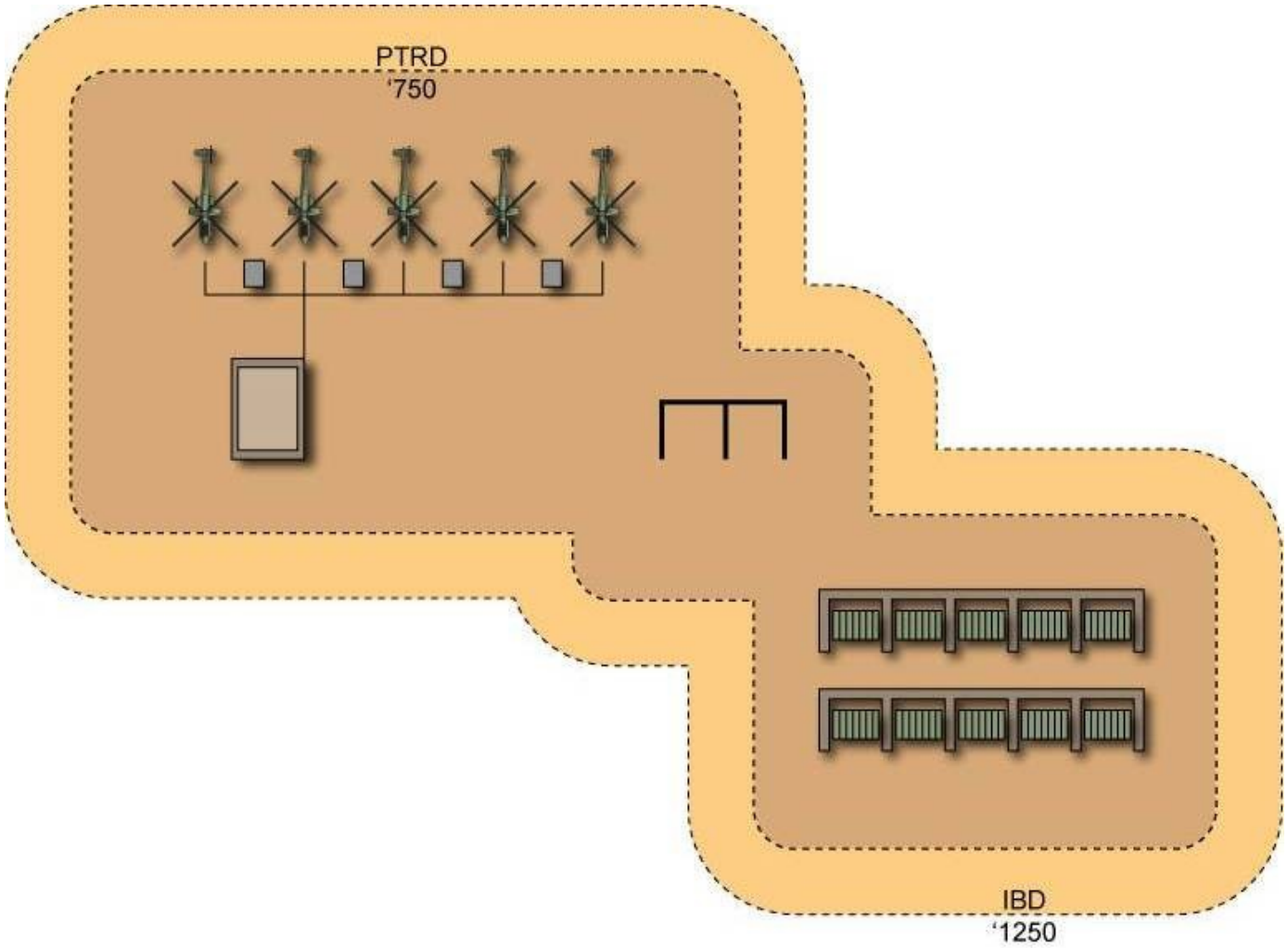
FARPs shall be separated by **IBD** from all non-associated inhabited buildings.

Ammunition placement sites on FARP will be a prudent fire distance away from FARP fuel storage sites, **but not less than 100 feet.**

WARNING

An aircraft is positioned so that its weapons are not pointed toward the fuel source, **ammunition holding area (AHA),** or troop sleeping tent in case a weapon discharges by accident. FARP personnel will not walk in front of aircraft weapons systems. (FM 3-04.104)

Topic 4.5 FARP, PTRD and IBD



Workshop Focus – Topic 5

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

Topic 5 CAPA

This section will discuss the following:

5.1 CAPA Defined

5.2 CAPA Incidents

5.3 ESQD for CAPA

5.4 CAPA Example

5.1 Combat Aircraft Parking Area

A **combat aircraft parking area (CAPA)** is a parking area for aircraft uploaded with ammo to be available for quick reaction.

CAPA

5.1 Combat Aircraft Parking Area, con

Arming and de-arming of aircraft should not be permitted at the CAPA.

Major maintenance, particularly involving weapons systems should not be performed on armed aircraft.

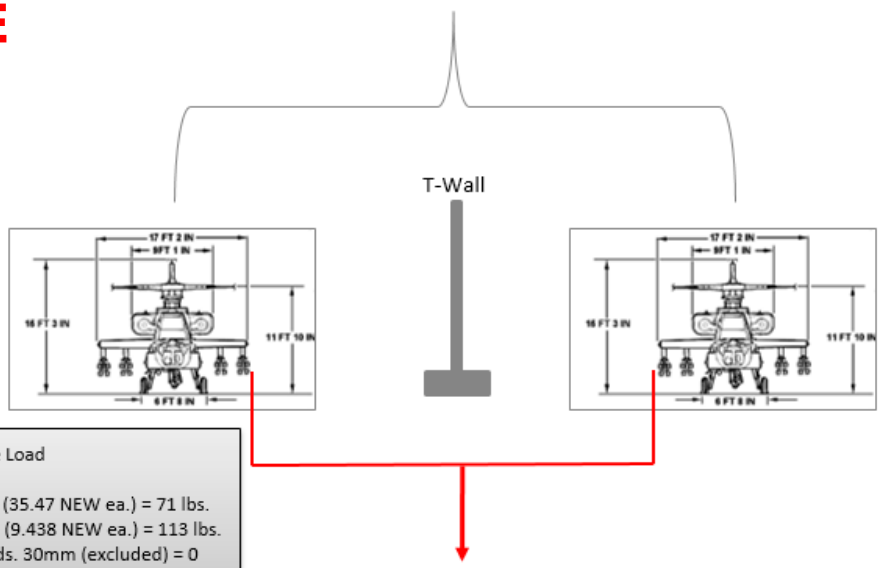
Ammo

5.1 Combat Aircraft Parking Area, con

For loaded aircraft to loaded aircraft, measure the shortest distance between explosives on one aircraft to explosives on the adjacent aircraft. This distance must equal IMD

EXAMPLE

24.34 m (80 ft.) Parking Spaces
Measured between centerlines



19.21m (63 ft.) separation
Measured between wing-stores
Equates to **Inter-magazine Distance (IMD) Un-barricaded**

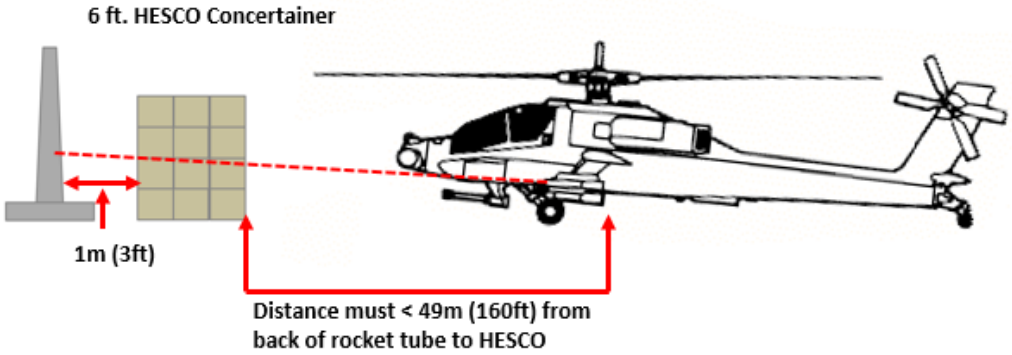
5.2 Examples of CAPA Incidents

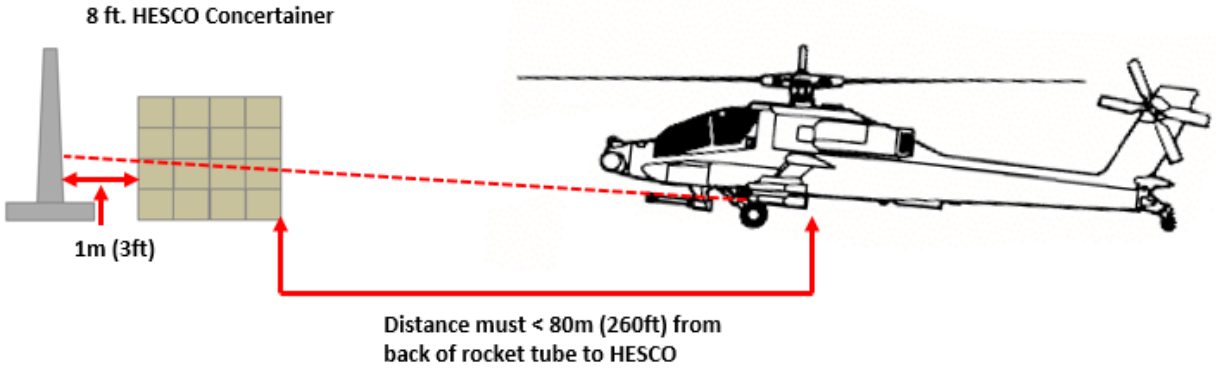
5.2 Examples of CAPA Incidents, cont.

CAPA

5.2 CAPA Barricades.

In order to mitigate damage from an incidental/accidental discharge, use the below configuration. Ensure area where possible round would strike T-wall is at a minimum of 10 inch thicl





5.3 ESQD for CAPA

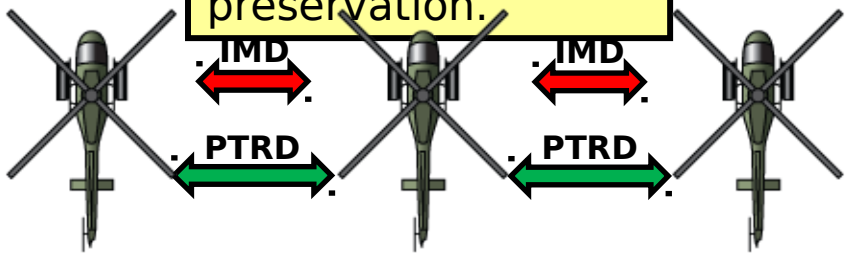
Each pad requires a minimum separation based on aircraft type and associated rotor distance.

Barricading can be used to reduce the ESQD.

Minimum separation distance should only prevent propagation from one aircraft to another.

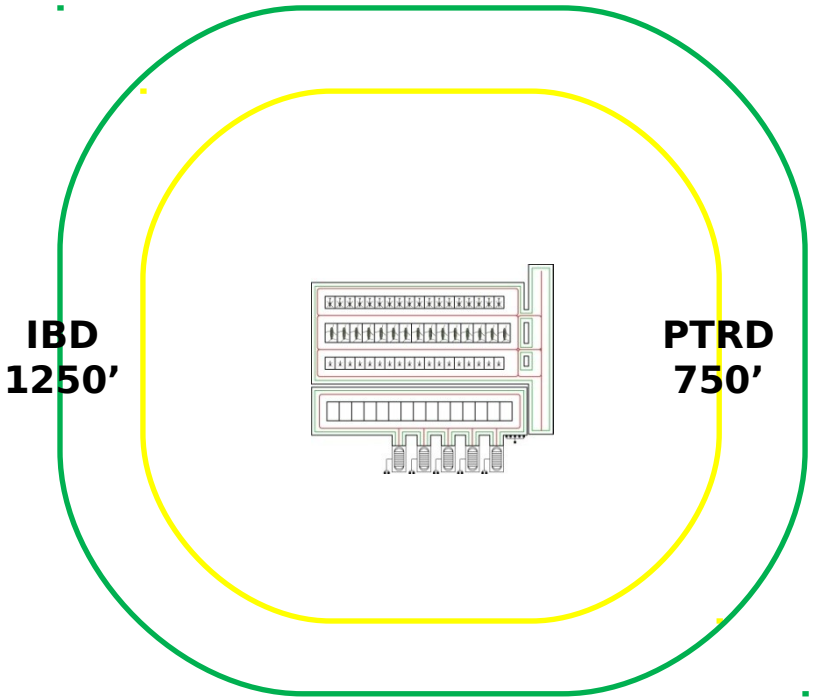
US Air Force requires asset preservation distance.

IMD does **not** provide for asset preservation.

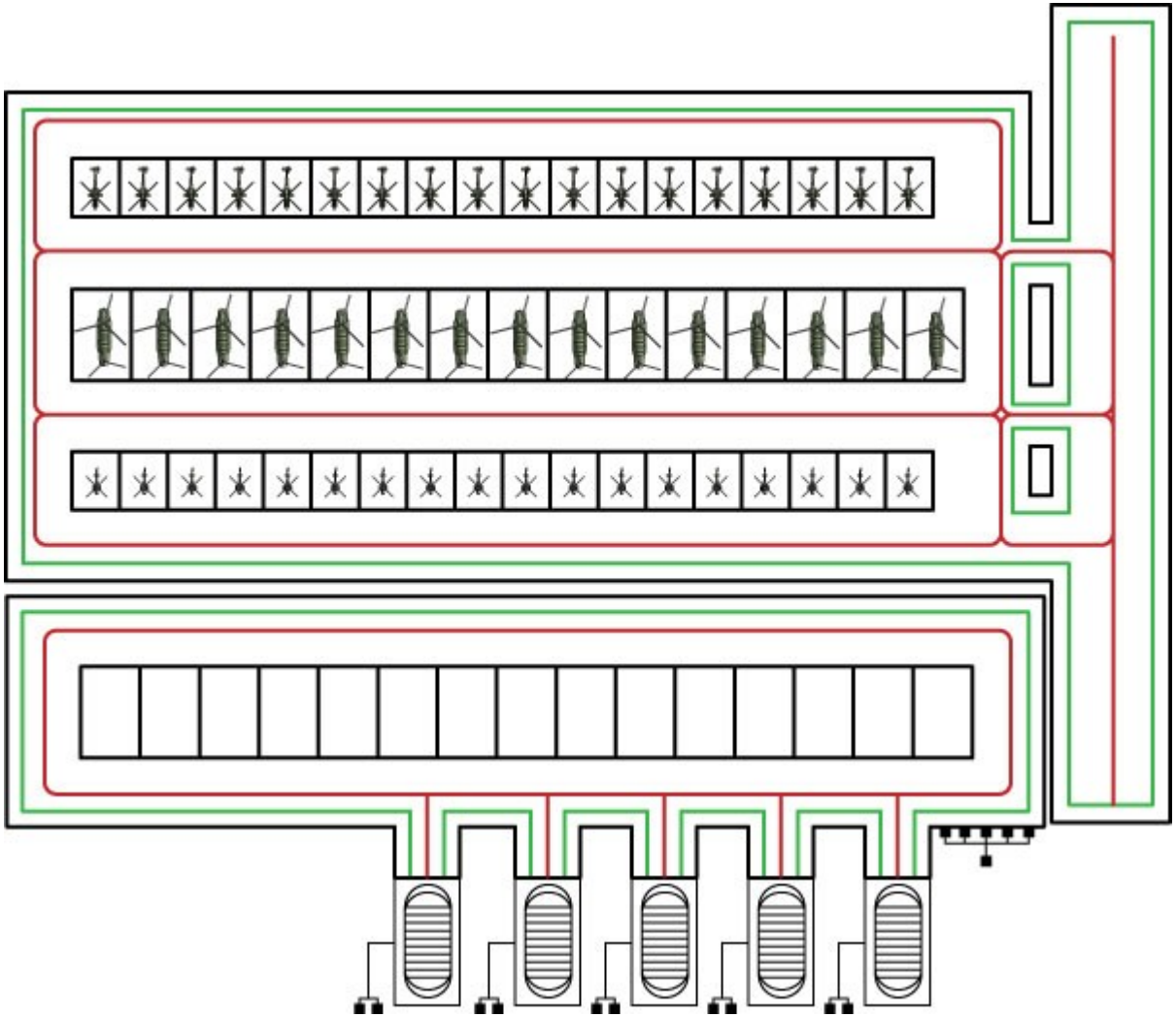


5.3 ESQD for CAPA, cont.

Protection must be provided to all IBD/PTRD exposures from the ammo loaded aircraft at the CAPA.



Topic 5.4 Actual CAPA Example



Workshop Focus – Topic 6

Topic 1 General Explosives Safety

Topic 2 Explosives Safety Quantity Distance (ESQD)

Topic 3 Explosives Loaded Combat Vehicle Parking

Topic 4 Forward Arming and Refueling Point (FARP

Topic 5 Combat Aircraft Parking Area (CAPA)

Topic 6 Deviation Approval and Risk Acceptance Document (DARAD)

Topic 6 DARAD

This section will discuss the following:

6.1 DARAD Defined

6.2 The Federal Tort Claims Act

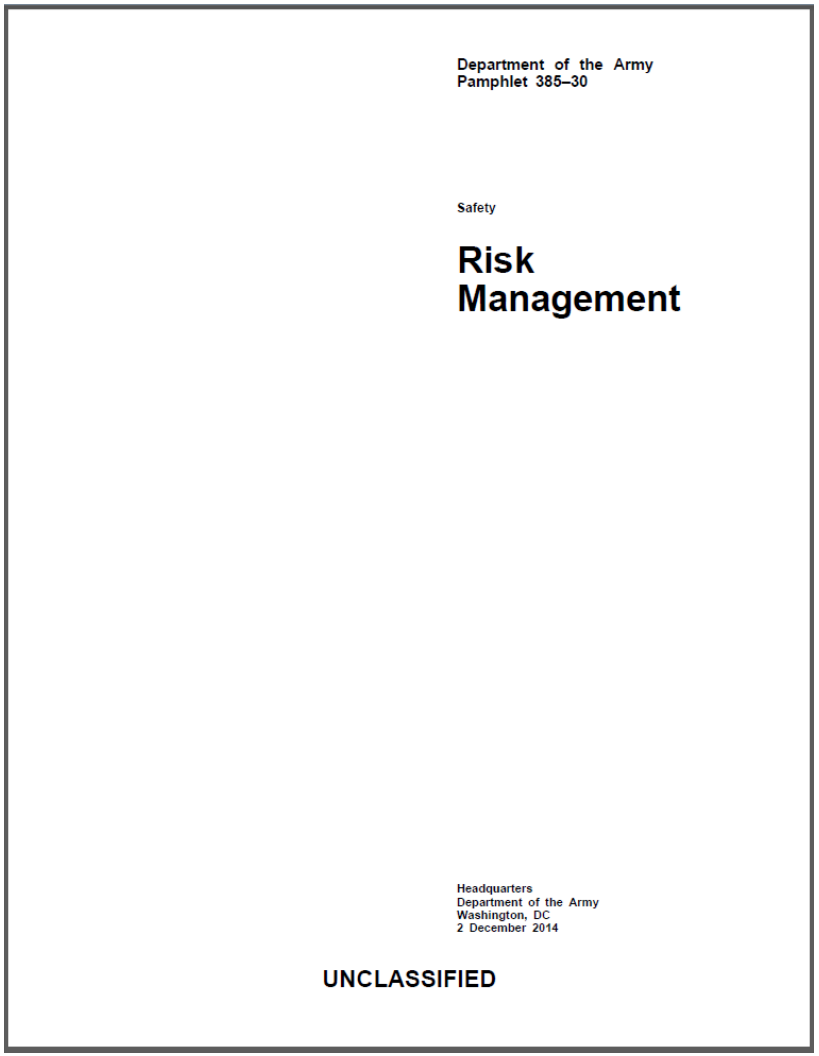
6.3 DA Form 7632

6.1 DARAD

DA Pam 385-30
Risk Management
2 December 2014

DA Form 7632, Deviation Approval and Risk Acceptance Document replaces Certificate of Risk Acceptance (CoRA).

Instructions for completing DA Form 7632 are contained in Appendix C of DA Pam 385-30.


Department of the Army
Pamphlet 385–30

Safety

Risk Management

Headquarters
Department of the Army
Washington, DC
2 December 2014

UNCLASSIFIED

DA Pam 385-30

6.2 The Federal Tort Claims Act

The Federal Tort Claims Act (FTCA) (28 United States Code, Section 2671 (28 USC 2671)) waives sovereign immunity and constitutes the consent of the United States Government to be sued for the negligent acts of its employees who were acting within the scope of their employment.

Important Points:

- The objective was not to make the Government "absolutely liable" to everybody for everything.
- Injured persons can recover monetary damages in a tort suit against the United States Government.

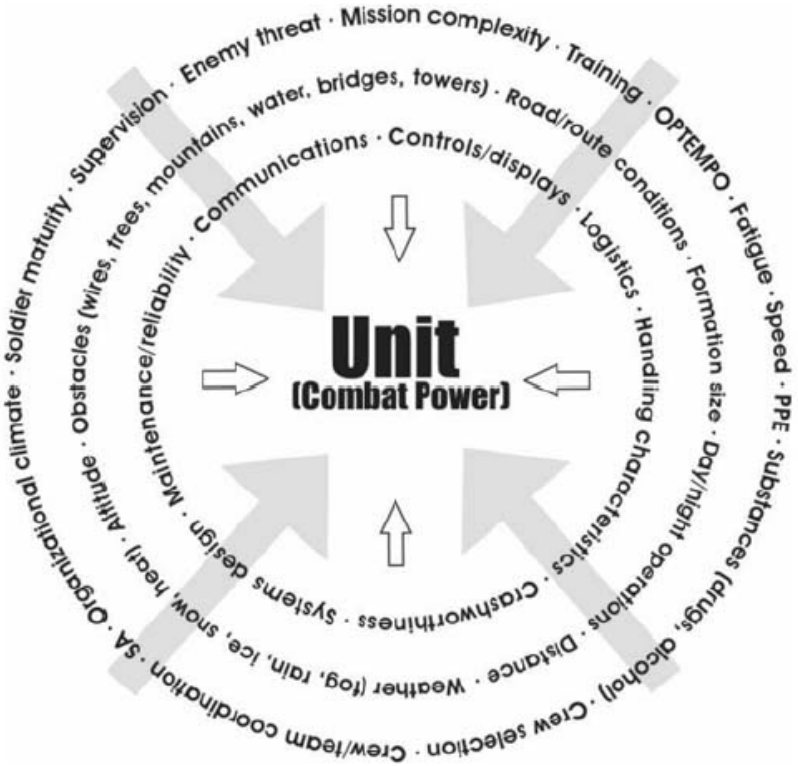
Congressional building

6.2 Military Discretionary Decisions

"Military discretionary decisions" consists of weighing and integrating the benefits, costs, safety and other factors into mission accomplishment.

The key to meeting the military discretionary decision consists of two critical elements:

1. Process
2. Documentation

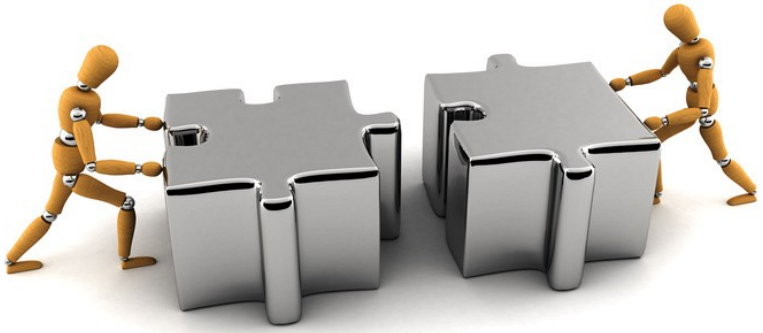

Unit
(Combat Power)
Enemy threat · Mission complexity · Training · OPTEMPO · Fatigue · Speed · PPE · Substances (drugs, alcohol) · Crew selection · Crew/team coordination · SA · Organizational climate · Soldier maturity · Supervision
Obstacles (wires, trees, mountains, water, bridges, towers) · Road/route conditions · Formation size · Day/night operations · Distance · Weather (fog, rain, ice, snow, heat) · Altitude
Communications · Controls/displays · Logistics · Handling characteristics · Crashworthiness · Systems design · Maintenance/reliability

Excerpted from DA Pam 385-30

6.2 Military Discretionary Decisions, cont.

The "military discretionary decision" is a well-defined, documented and articulated **process**, such as the Mishap Risk Management Process.

The Deviation Approval and Risk Acceptance Document (or similar record) helps **document** the decision as part of a conscious and well-informed decision making process.



6.3 DA Form 7632, DARAD

DA Form 7632, DARAD is used for:

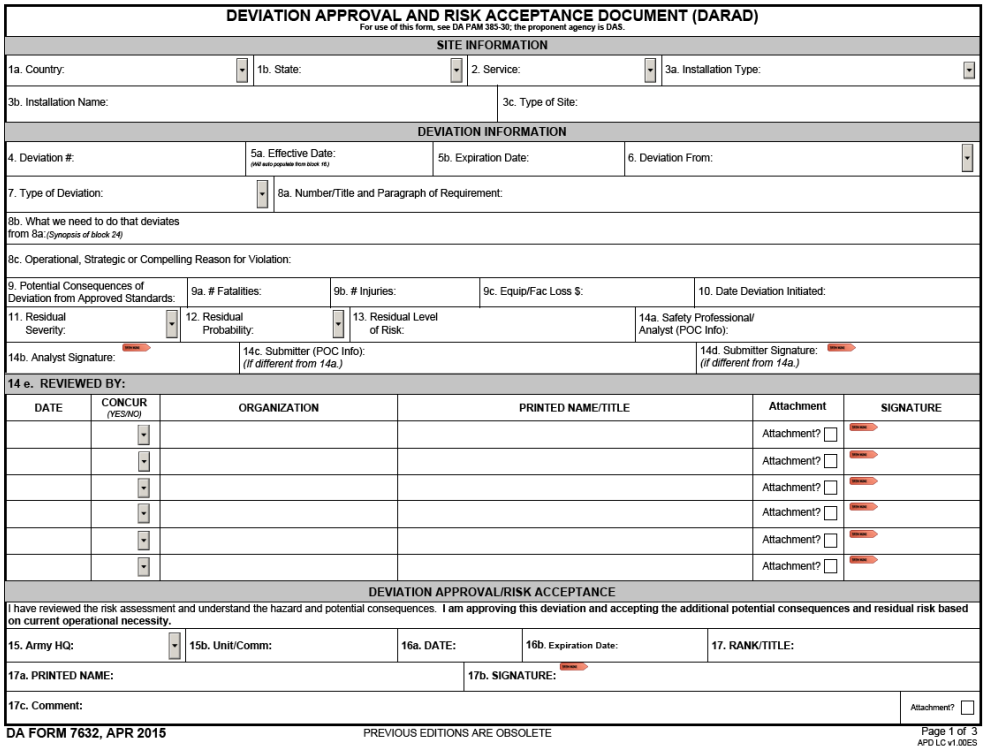
- Peace time
- Contingencies
- Combat operations
- Military operations other than war (MOOTW)
- Associated training that cannot meet minimum explosives safety standards

Inspecting ammo

6.3 DARAD, cont.

All options must be explored to try and comply with DoD and DA standards prior to obtaining a DARAD.

Justification for non-compliance must be provided in the DARAD.



DEVIATION APPROVAL AND RISK ACCEPTANCE DOCUMENT (DARAD)
For use of this form, see DA PAM 383-30; the proponent agency is DAS.

SITE INFORMATION

1a. Country:	1b. State:	2. Service:	3a. Installation Type:
3b. Installation Name:		3c. Type of Site:	

DEVIATION INFORMATION

4. Deviation #:	5a. Effective Date: (Will auto populate from block 16)	5b. Expiration Date:	6. Deviation From:
7. Type of Deviation:	8a. Number/Title and Paragraph of Requirement:		

8b. What we need to do that deviates from 8a. *(Synopsis of block 24)*

8c. Operational, Strategic or Compelling Reason for Violation:

9. Potential Consequences of Deviation from Approved Standards:	9a. # Fatalities:	9b. # Injuries:	9c. Equip/Fac Loss $:	10. Date Deviation Initiated:

11. Residual Severity:	12. Residual Probability:	13. Residual Level of Risk:	14a. Safety Professional/ Analyst (POC Info):

14b. Analyst Signature:	14c. Submitter (POC Info): *(If different from 14a.)*	14d. Submitter Signature: *(If different from 14a.)*

14 e. REVIEWED BY:

DATE	CONCUR (YES/NO)	ORGANIZATION	PRINTED NAME/TITLE	Attachment	SIGNATURE
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	

DEVIATION APPROVAL/RISK ACCEPTANCE

I have reviewed the risk assessment and understand the hazard and potential consequences. **I am approving this deviation and accepting the additional potential consequences and residual risk based on current operational necessity.**

15. Army HQ:	15b. Unit/Comm:	16a. DATE:	16b. Expiration Date:	17. RANK/TITLE:

17a. PRINTED NAME:	17b. SIGNATURE:

17c. Comment: Attachment? ☐

DA FORM 7632, APR 2015 PREVIOUS EDITIONS ARE OBSOLETE Page 1 of 3
APD LC v1.00ES

DARAD page 1

A DARAD IS NOT FOR CONVENIENCE.

6.3 DARAD, Pages 1

DEVIATION APPROVAL AND RISK ACCEPTANCE DOCUMENT (DARAD)

For use of this form, see DA PAM 385-30; the proponent agency is DAS.

SITE INFORMATION

1a. Country:	1b. State:	2. Service:	3a. Installation Type:
3b. Installation Name:		3c. Type of Site:	

DEVIATION INFORMATION

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7. Type of Deviation:	8a. Number/Title and Paragraph of Requirement:		
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14b. Analyst Signature:	14c. Submitter (POC Info): *(If different from 14a.)*		14d. Submitter Signature: *(if different from 14a.)*	

14 e. REVIEWED BY:

DATE	CONCUR (YES/NO)	ORGANIZATION	PRINTED NAME/TITLE	Attachment	SIGNATURE
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	
				Attachment? ☐	

DEVIATION APPROVAL/RISK ACCEPTANCE

I have reviewed the risk assessment and understand the hazard and potential consequences. **I am approving this deviation and accepting the additional potential consequences and residual risk based on current operational necessity.**

15. Army HQ:	15b. Unit/Comm:	16a. DATE:	16b. Expiration Date:	17. RANK/TITLE:
17a. PRINTED NAME:		17b. SIGNATURE:		
17c. Comment:				Attachment? ☐

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RISK ASSESSMENT WORKSHEET

Deviation #:	Effective Date:	Expiration Date:	

RISK ANALYSIS INFORMATION

18. Current Situation: "Provide a description of the situation that necessitates this deviation." — Attachment? ☐

19. Hazard Category: | 20. Specific Hazard:

21. Duration of Deviation *(Choose **one** of the following)*

21a. 1 month or less: *(select the duration (in days))*	21b. 1 month to 1 year: *(select the duration (in months))*	21c. 1 year to 5 years: *(select the duration (in years))*	21d. Permanent or greater than 5 years: *(enter number of years or PERMANENT)*
0	0	0	

22. Deviation Approval Authority: *(or Equivalent)*

23. Mission Impact of Not Accepting Risk: — Attachment? ☐

24. What we need to do that violates 8a: *(Provide a detailed description of the action that deviates from the standards.)* — Attachment? ☐

25. Control Measures: "Measures taken, or will take, to reduce hazards of risk being accepted." — Attachment? ☐

26. Permanent Corrective Actions (with Milestones): Include estimated cost, military construction project number, etc. — Attachment? ☐

27. Alternatives Considered: "Things considered doing but didn't, and why." — Attachment? ☐

Alternative 1:

Alternative 2:

Alternative 3:

28. Attach any supporting documents (i.e. Photos, MOU, ASAP-X, ESS, etc.) — Attachment? ☐

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6.3 DARAD, Page 3

AMMUNITION AND EXPLOSIVES WORKSHEET

Deviation #:	Effective Date:	Expiration Date:

INFORMATION ON THE POTENTIAL EXPLOSION SITE (PES)

29a. PES Name/#:	29b. PES Function:	30. PES # People:
31. PES Equip/Fac (Value) $:	32. Required Blast Distance:	33. Required Fragment Distance:
34a. Hazard Division: 1.1: NEW:	34b. Hazard Division: 1.2.1: NEW:	34c. Hazard Division: 1.2.2: NEW:
34d. Hazard Division: 1.2.3: NEW:	34e. Hazard Division: 1.3: NEW:	34f. Hazard Division: 1.4: NEW/MEQ:

35a. QD arcs exceed the installation boundary? YES ☐ NO ☐	Are other Services affected? YES ☐ NO ☐	Was coordination made? YES ☐ NO ☐	Provide other coordination documentation, as necessary.

Why coordination was/was not made:	Coordination paperwork attached? ☐
35b. Is this deviation associated with a hybrid or risk-base safety submission?	35c. If YES, provide site plan #:

INFORMATION ON THE EXPOSED SITES (ES)

36. EXPOSED SITES — At Required Distance | At Requested Distances | (Attachment?) ☐

FACILITY	DISTANCE: REQUIRED / ACTUAL	# PEOPLE	EQUIP/FAC (VALUE) $	EXPOSURE TYPE	ON/OFF INSTALLATION	FATALITIES	INJURIES	EQUIP/FAC (LOSS) $	FATALITIES	INJURIES	EQUIP/FAC (LOSS) $	VIOLATION?
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO
	0 / 0											NO

EXPECTED POTENTIAL CONSEQUENCES

37. Potential Explosion Site:	a. Fatalities:	b. Injuries:	c. Equip/Fac $:
38. Potential Losses for Exposed Sites (ES) Meeting Criteria:	a. Fatalities:	b. Injuries:	c. Equip/Fac $
39. Potential Loss Being Accepted for Deviating from Approved Standards:	a. Fatalities:	b. Injuries:	c. Equip/Fac $
40. Total Potential Loss (#/$):	a. Fatalities:	b. Injuries:	c. Equip/Fac $

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6.3 DARAD, Risk Acceptance Authorit

NOTE: If a DARAD expires and needs to be re-issued it can only be approved at the next higher level.

Table 4–1.
Risk acceptance authority for safety standards deviation

Risk acceptance matrix[2, 3, 4, 5]				
	Duration of risk			
	Event waiver	Waiver		Exemption
Category of risk	1 month or less	1 month to 1 year	1 year to 5 years	Permanent or greater than 5 years
Extremely high risk	General officer (GO)	Army Headquarters Commanding General (CG)	Army Headquarters CG	Army Headquarters CG
High risk	Brigade commanding officer (CO) or responsible O–6	GO	GO	GO
Medium risk	Battalion CO[1] or responsible O–5	Brigade CO[1] or responsible O–6	GO[1]	GO[1]
Low risk	Company CO or responsible O–3	Battalion CO[1] or responsible O–5	Brigade CO[1] or responsible O–6	Brigade CO[1] or responsible O–6

Legend for Table 4-1.:

In organizations led by Army civilian leaders, equivalent civilian grades may be substituted for military ranks (see table 4–2).

The term "Army Headquarters CG" used in the table refers to Army commands (ACOMs), Army service component command (ASCCs) (including Joint Forces Land Component Commands (JFLCC) and GO level Joint Task Forces (JTFs)), direct reporting units (DRUs), and the Director, Army National Guard.

Notes:

[1] May delegate in writing authority to accept at the next lower command level.

[2] For deviations involving violations of AE or chemical agent safety standards during Joint operations planning, training, and execution, refer to CJCSI 4360.01 and Service risk acceptance guidance. See also paragraph 4–6*i*.

[3] H risk (beyond 1 month) or EH risk will always be accepted by a GO or flag officer.

[4] For hazards discovered in fielded acquisition programs, risk will be accepted per DA Pam 385–16.

[5] Deviations from range standards and procedures are addressed in AR 385–63.

In Summary

The purpose of this workshop was to provide a high level, general discussion on the important points of TES. This included:

- General Explosives Safety
- Basic Explosives Safety Quantity Distance (ESQD)
- Explosives Loaded Combat Vehicle Parking
- Forward Arming and Refueling Point (FARP)
- Combat Aircraft Parking Area (CAPA)
- Deviation Approval and Risk Acceptance Document (DARAD)

Questions ?